

Preventing Unintentional Medication Poisoning in Children: 2016 Resource Guide



Organizations

Policy and Legislation

Current Prevention
Programs and
Resources

Publications

In 2012, nearly 6,000 children aged 0 through 4 were hospitalized and another 55,000 were treated and released from U.S. emergency rooms for medication poisoning (Health Care Utilization Project, National Inpatient Sample and National Emergency Department Sample, 2012). These poisonings resulted in \$154 million in medical spending and \$14 million in parent work losses (CSN EDARC analysis). Nearly all emergency department visits to young children (95 percent) are a result of unsupervised children getting into medication; only five percent of these visits were due to errors on the part of the caregiver (Pediatrics, 2011). Additionally, America's poison centers managed over 508,000 cases of pharmaceutical exposures in children 12 and under in 2014 alone. That's about one call per minute.

This resource guide provides links to organizations, programs, publications, and resources focused on medication safety. It is divided into four sections: (1) Organizations, (2) Policy and Legislation, (3) Current Prevention Programs and Resources, and (4) Publications. Each item in this resource guide includes a short description and a link to the resource itself. Descriptions of reports, guides, toolkits, campaigns, websites, and initiatives are, in most cases, excerpted from the resources themselves while descriptions of research studies are excerpted from the study abstracts.

Organizations

Poison Centers (1-800-222-1222)

Poison centers provide poison experts 24/7/365 to help the public and health care providers with treatment and prevention of poisonings, including medication poisoning.

Find your local poison center:

<http://www.aapcc.org/centers/>

Fact sheet: https://aapcc.s3.amazonaws.com/pdfs/annual_reports/2014_Annual_Report_Snapshot_FINAL.pdf

American Association of Poison Control Centers

The American Association of Poison Control Centers (AAPCC) represents the nation's 55 regional poison control centers (PCCs), which provide free, expert information and treatment advice, 24 hours a day, seven days a week, 365 days a year, through the national Poison Help line—1-800-222-1222. Each year, U.S. poison control centers answer more than 3 million calls about drug, consumer product, animal, environmental, and food poisoning. AAPCC accredits PCCs, coordinates national-level poison education and prevention programs and collaborations, and operates the National Poison Data System (NPDS).

<http://www.aapcc.org>

Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) researches the best ways to prevent violence and injuries, using science to create real-world solutions to keep people safe, healthy, and productive. The Injury Center produces and disseminates data reports and other useful publications on a variety of topics, including poisoning prevention.

<http://www.cdc.gov/homeandrecreationalafety/poisoning/index.html>

Institute for Safe Medication Practices

The Institute for Safe Medication Practices (ISMP) works to prevent medication errors and promote medication safety. The website has newsletters, webinars, tools, and more.

<http://www.ismp.org>

National Safety Council Poison Prevention Page

This webpage from the National Safety Council (NSC) provides information and resources about poison prevention.

http://www.nsc.org/safety_home/Resources/Pages/Poisoning.aspx

Poison Prevention Week Council

The Poison Prevention Week Council website has information about National Poison Prevention Week, which takes place on the third week in March each year. The website also has steps to prevent unintentional poisonings as well as tips to get your community involved in poison prevention. In addition, it also includes a page of poison prevention materials.

<http://www.poisonprevention.org>

HRSA Poison Help

The Health Resources and Services Administration (HRSA) funds the Poison Help telephone line. The website provides tips to prevent poisoning,

emergency checklists, and information on what to do in the event of poisoning.

<http://poisonhelp.hrsa.gov>



The PROTECT Initiative: Advancing Children's Medication Safety | CDC

The PROTECT Initiative works to reduce emergency department visits for unintentional medication overdoses in kids. It is a collaboration of government agencies, industry partners (pharmaceutical and medication packaging industries), non-profits, professional organizations, and academic representatives. There are four workgroups: unsupervised ingestions, medication errors, education, and scientific. The PROTECT Initiative developed and launched the Up and Away and Out of Sight campaign.



http://www.cdc.gov/MedicationSafety/protect/protect_Initiative.html

Safe Kids Worldwide

Safe Kids Worldwide is a global non-profit working to prevent childhood injuries. The website includes fact sheets on a variety of topics, tip sheets, blog posts, infographics, and research reports. The resources are divided by injury topic as well as age. Safe Kids launched the *Safe Storage, Safe Dosing* campaign in 2012 to prevent medication poisoning. In 2013, they published their report on unintentional medication poisoning, titled *An In-Depth Look at Keeping Young Children Safe Around Medicine*.

<http://www.safekids.org>

U.S. Consumer Product Safety Commission

The U.S. Consumer Product Safety Commission (CPSC) works to keep consumers safe from hazardous products that cause injuries or death. The website posts information about product recalls; provides safety education; has an overview of regulations, laws, and standards; research and statistics; and more.

<http://www.cpsc.gov>

U.S. Food and Drug Administration

The U.S. Food and Drug Administration (FDA) is a federal agency responsible for regulating food, medication, tobacco products, cosmetics, and more.

<http://www.fda.gov>

Policy and Legislation

Poison Prevention Packaging Act

The Poison Prevention Packaging Act (PPPA) was enacted in 1970 and requires household substances deemed poisonous to be packaged in child-resistant packaging. Some prescription drugs may be given to patients in non-child-resistant packaging upon specific request. Since the regulation has been in effect, there have been remarkable declines in reported deaths from ingestions by children of toxic household products including medications. This webpage from CPSC outlines the law.

<http://www.cpsc.gov/en/Regulations-Laws--Standards/Statutes/Poison-Prevention-Packaging-Act/>

Current Prevention Programs and Resources

Over the Counter (OTC) Medicine Safety

Co-developed by the American Association of Poison Control Centers, OTC Medicine Safety is a 100% free, evidence-based set of resources designed to empower teachers, school nurses, and community health educators to facilitate critical medicine safety discussions with pre-adolescents and adolescents.

<http://www.scholastic.com/otcmedsafety>

National Poison Data System | AAPCC

The National Poison Data System (NPDS) tracks details of incoming calls to poison control centers and can track poison exposure outbreaks. This is updated by AAPCC staff in real time.

<http://www.aapcc.org/data-system/>

Safe Storage, Safe Dosing | Safe Kids

This campaign from Safe Kids was launched in March 2012 in conjunction with Safe Storage, Safe Dosing, Safe Kids: A Report to the Nation on Safe Medication. The report examines trends in morbidity and mortality of medication poisoning among children ages 14 and under. It underscores the challenge of medication-related poisoning among children and offers solutions that will reverse the trends. Safe Kids also proposes specific roles that parents and other caregivers, industry, governments, and the medical community can play in improving medication safety through safe storage and safe dosing.

<http://www.safekids.org/medicinesafety>

Safe Use Initiative | U.S. Food and Drug Administration

The Safe Use Initiative from the FDA works to create and facilitate public and private partnerships between healthcare organizations. The goal is to reduce medication poisonings by identifying specific, preventable medication risks and developing, implementing and evaluating cross-sector interventions with partners.

Initiative: <http://www.fda.gov/Drugs/DrugSafety/SafeUseInitiative/default.htm>

Report: <http://www.fda.gov/downloads/Drugs/DrugSafety/UCM188961.pdf>

Up and Away and Out of Sight

Up and Away and Out of Sight is a campaign to prevent medication poisoning by educating families about the importance of storing medication safely. The campaign was in partnership with the Centers for Disease Control and Prevention, the Consumer Healthcare Products Association Educational Foundation, and more.

<http://www.upandaway.org>

Publications

2014 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 32nd Annual Report | Clinical Toxicology (2015)

This is the 32nd Annual Report of the AAPCC's NPDS. These data support the continued value of PC expertise and need for specialized medical toxicology information to manage more serious exposures, despite a decrease in calls involving less serious exposures. Unintentional and intentional exposures continue to be a significant cause of morbidity and mortality in the U.S. The near real-time, always current status of NPDS represents a national public health resource to collect and monitor U.S. exposure cases and information calls.

<http://www.tandfonline.com/doi/full/10.3109/15563650.2015.1102927>

Accidental Ingestion of Potentially Harmful Substances: Analyzing Pediatric Emergency Department Presentations to Guide Health Promotion Advice and Triage | Archives of Disease in Childhood (2015)

Accidental ingestion of a potentially harmful substance is a common complaint in pediatric emergency departments - in 2002, 31,500 children <15 years old attended hospital with suspected poisoning. Large UK based studies focus on fatal poisonings. However, most children do not require any treatment, and the literature currently lacks detail regarding the minor end of the spectrum. Although most events happened while the child was unsupervised, there were few health visitor referrals - a key strategy in preventing further incidents. Most substances ingested were medications or cleaning products. Children can sometimes still open 'child resistant' containers, so health promotion advice should focus on safer storage.

http://adc.bmj.com/content/100/Suppl_3/A37.1.abstract

An In-Depth Look at Keeping Young Children Safe Around Medicine | Safe Kids (2013)

In its report, Safe Kids examines data from the CPSC, information from poison control centers and findings from several focus groups among moms. The report reviews what is happening in households that leads to these disturbing numbers and offers parents simple steps to protect their children.

<http://www.safekids.org/medsreport>

“But They Can’t Reach That High...”: Parental Perceptions and Knowledge Relating to Childhood Poisoning | Health Promotion Journal of Australia (2011)

This article examines the importance of preventing childhood poisoning and the wide void between what is recommended by prevention programs and the evidence, and what is acted upon in the day-to-day family environment. This paper seeks to probe behind aspects of this void by examining parental perceptions in relation to childhood poisoning within a Health Belief Model framework. The introduction and the abstract are available for free and the full article is available for purchase.

<http://www.ncbi.nlm.nih.gov/pubmed/22497066>

Children at Risk of Medicinal and Non-Medicinal Poisoning: A Population-Based Case-Control Study in General Practice | British Journal of General Practice (2012)

While medicines prescribed by primary care are potential poisoning agents, the risk factors for poisoning from medication are not well described. The aim of this study was to identify risk factors for medicinal and non-medicinal poisoning in preschool children. Primary care data can be used to target interventions to children at risk of poisoning. This is pertinent when prescribing for children/family members, as prescribed medications may become poisoning agents. Prompt identification of maternal depression and alcohol misuse, and delivery of poisoning-prevention interventions at this stage may help prevent poisonings.

<http://www.ncbi.nlm.nih.gov/pubmed/23211263>

Child Poisonings Are More Common In Households Experiencing Psychosocial Stressors | Evidence-Based Medicine (2013)

This article describes studies that have pointed to a disproportionate number of such incidents occurring in single-parent families or those under the stress of recent moves or financial hardships. The article later discusses poisoned children and how they sometimes have parents who are socially isolated or have issues of mental or physical illness. Poisonings involving toddlers most often occur in their homes, when hazardous products or potent medicines may be easily available.

<http://ebm.bmj.com/content/18/5/e49.extract>



Easy-Access Medicines a Poisoning Risk for Kids at Home | C.S. Mott Children's Hospital (2012)

In January 2012, the C.S. Mott Children's Hospital National Poll on Children's Health asked parents and grandparents of children 1-5 years old about the presence of medicines in their homes and how they store those medicines. In addition, adults across the country were asked whether they would support requirements for new types of packaging for medicines to reduce risks for children. The poll found that, overall, 79% of parents and 85% of grandparents of young kids reported having prescription medicine at home. Grandparents were four times more likely than parents to keep prescription medicine in easy-access places. In addition, about two-thirds of adults overall would support potential new laws that would require medicines to be packaged as single doses.

<http://www.mottnpch.org/sites/default/files/documents/041612poisoningreport.pdf>

Effect of Cough and Cold Medication Restriction and Label Changes on Pediatric Ingestions Reported to U.S. Poison Centers | Journal of Pediatrics (2013)

The objective of this study was to determine the impact of industry and Food and Drug Administration initiatives implemented to limit the use of over-the-counter (OTC) cough and cold medications in children younger than six years of age. The restriction of OTC cough and cold medications has led to a decline in unintentional ingestions, therapeutic errors, health care facility referral, and serious medical outcomes in children younger than two years of age. There has also been a decline in ingestions in 2- to 5-year-old children.

<http://www.sciencedirect.com/science/article/pii/S0022347613005192>

The Effectiveness of Different Interventions to Promote Poison Prevention Behaviors in Households with Children: A Network Meta-Analysis | PLOS One (2015)

There is evidence from two previous meta-analyses that interventions to promote poison prevention behaviors are effective in increasing a range of poison prevention practices in households with children. Authors aimed to use network meta-analysis to simultaneously evaluate the effectiveness of different interventions to increase prevalence of safe storage of i) Medicines only, ii) Other household products only, iii) Poisons (both medicines and non-medicines), iv) Poisonous plants; and v) Possession of poison control center (PCC) telephone number in households with children. Twenty-eight of the 47 primary studies identified were included in the analysis. Compared to usual care intervention, the intervention with education and low cost/free equipment elements was most effective in promoting safe storage of medicines.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0121122>

Emergency Hospitalizations for Unsupervised Prescription Medication Ingestions by Young Children | Pediatrics (2014)

Emergency department visits and subsequent hospitalizations of young children after unsupervised ingestions of prescription medications are increasing despite widespread use of child-resistant packaging and caregiver education efforts. Data on the medications implicated in ingestions are limited but could help identify prevention priorities and intervention strategies. Focusing unsupervised ingestion prevention efforts on medications with the highest hospitalization rates may efficiently achieve large public health impact.

<http://pediatrics.aappublications.org/content/early/2014/09/09/peds.2014-0840>



The Epidemiology of Poisoning | Medicine (2007)

This article explains the epidemiology of poisoning and how it can be studied from different perspectives. These include overall mortality, hospital admission rates, and inquiries to Poison Information Services. Accidental poisoning is most common in children, but deliberate self-harm becomes predominant in teenage years and early adulthood. Understanding the patterns can assist in developing suicide prevention strategies and reducing the risks of accidental poisoning.

<http://www.sciencedirect.com/science/article/pii/S1357303907002058>



Evaluation of Changes in Poisoning in Young Children: 2000 to 2010 | Pediatric Emergency Care (2010)

The nature of pediatric poisonings changes over time. This study evaluated poisoning in children younger than six years for trends during an 11-year period regarding the substances involved in the poisoning, medical outcomes, and health care use. The study found that poisoning in young children increasingly involves pharmaceuticals and is associated with an increased number of serious outcomes and children treated in a health care facility. These changes may be related to increased availability of medications in the home and poison prevention education efforts should include a focus on the availability of these products to children.

http://journals.lww.com/pec-online/Abstract/2013/05000/Evaluation_of_Changes_in_Poisoning_in_Young.15.aspx

Hospital Admissions for Unintentional Poisoning in Preschool Children in England; 2000-2011 | Archives of Disease in Childhood (2015)

The study authors conducted a population based time-trend analysis of all unplanned admissions to National Health Service hospitals for poisoning in preschool children (aged less than five years) in England, between 2000 and 2011. Hospital admission rates for poisoning (medicinal and non-medicinal) decreased overall from 179 per 100,000 in 2000 to 139 per 100,000 in 2011. The relative risk of hospital admission from the most deprived quintile compared with the least deprived quintile reduced from 2.37 in 2000 to 1.37 in 2011. Poisoning admissions in preschool children have decreased by 23% over the past decade. Although social gradients have narrowed, those from the most deprived areas are at higher risk of poisoning, and may benefit from targeted schemes of home safety education in deprived areas.

<http://adc.bmj.com/content/100/2/180.short>

Keeping Families Safe Around Medicine | Safe Kids (2014)

Every minute of every day, a poison control center answers a call about a young child getting into medicine or getting too much medicine. In 2012, there were almost 64,000 emergency department visits that involved a child exposed to medicine. Every one of these emergency department visits involved a scared child and a worried family, and could have been prevented. On top of that, an estimated \$34.4 million is spent every year on medical costs for trips to the emergency department as a result of medicine exposures in young children, twice what the federal government spends annually on poison control centers.

http://www.safekids.org/med_report_2014

Lock Up Poisons: Tip Sheet | U.S. Consumer Product Safety Commission

This tip sheet from CPSC describes what is poisonous and how to keep children from ingesting these poisons.

<http://www.cpsc.gov//PageFiles/114224/382.pdf>

A National Action Plan for Child Injury Prevention: Reducing Poisoning Injuries | CDC (2012)

According to the CDC, unintentional poisoning killed 824 U.S. children in 2009; 90% of them were teenagers. 128,000 children visited emergency departments for poisoning-related injuries in 2010; half of them were teens. Prescription drug misuse and abuse among teens has reached epidemic proportions and is now a serious public health threat. In 2010, more than 7% of young people 12-17 years old reported using prescription drugs for non-medical reasons in the past year. More concerning, the prescription drug death rate more than doubled among this age group from 1999-2008. The National Action Plan, published in April of 2012, by the CDC, discusses strategies to prevent prescription drug poisoning among children.

http://www.cdc.gov/safekid/pdf/NAP_Poison_v9Final.pdf

New Insights into Root Causes of Pediatric Accidental Unsupervised Ingestions of Over-The-Counter Medications | Clinical Toxicology (2013)

Changes to regulations, packaging, and labeling and ongoing educational efforts are intended to support appropriate use of medicines. Yet annually poison centers receive more than 500,000 reports of accidental or unsupervised exposure to medicines for children under six years of age. To identify root (i.e., fundamental and preventable) causes of accidental unsupervised ingestions (AUIs), authors designed a questionnaire and conducted a follow-up survey of caregivers who contacted McNeil Consumer Healthcare (McNeil) following an AUI by a child under 12 years of age.

<http://www.tandfonline.com/doi/full/10.3109/15563650.2013.855314>

Out-of-Hospital Medication Errors among Young Children in the U.S., 2002-2012 | Pediatrics (2014)

This is the first comprehensive study to evaluate the epidemiologic characteristics of out-of-hospital medication errors among children less than six years of age on a national level. Increased efforts are needed to prevent medication errors, especially those involving non-cough and cold preparations, among young children.

<http://pediatrics.aappublications.org/content/early/2014/10/15/peds.2014-0309>

Pediatric Information in Drug Product Labeling | Journal of American Medical Association (2012)

This study from the U.S. Food and Drug Administration found that around half of drug labels do not have information on safety and proper dosing for children.

<http://jama.jamanetwork.com/article.aspx?articleid=1151522>

Pediatric Poisonings in Children Younger than Five Years Responded to by Paramedics | Journal of Emergency Medicine (2011)

This study was conducted to describe the incidence and demographics of accidental poisonings incurred by children under five years old whose caregivers accessed paramedics through the 9-11 system in the County of San Diego, California. The study found that 56% of these poisonings involved either prescription or over-the-counter medications.

<http://www.sciencedirect.com/science/article/pii/S073646791000911X>

Preventing Medication Overdoses in Young Children: An Opportunity for Harm Elimination | Pediatrics (2011)

Medication overdoses in young children are an increasingly common public health problem, but it is a preventable problem that can be addressed by combining strategies. The introduction of child-resistant packaging (CRP), product reformulations, heightened parental awareness, and poison control professionals and systems have made deaths from pediatric poisonings uncommon. The morbidity rate from medication overdoses, measured by emergency department visits and from calls to poison control centers, has been rising.

<http://pediatrics.aappublications.org/content/127/6/e1597.full.pdf>

Prevention of Childhood Poisoning In the Home: Overview of Systematic Reviews and a Systematic Review of Primary Studies | International Journal of Injury Control and Safety Promotion (2016)

Unintentional poisoning is a significant child public health problem. This systematic overview of re-views, supplemented with a systematic review of recently published primary studies synthesizes evidence on non-legislative interventions to reduce childhood poisonings in the home with particular reference to interventions that could be implemented by Children's Centers in England or community health or social care services in other high income countries. Thirteen systematic reviews, two meta-analyses and 47 primary studies were identified. The interventions most commonly comprised education, provision of cupboard/drawer locks, and poison control center (PCC) number stickers. Meta-analyses and primary studies provided evidence that interventions improved poison prevention practices.

<http://www.tandfonline.com/doi/full/10.1080/17457300.2015.1032978>

Regional Variations in Pediatric Medication Exposure: Spatial Analysis of Poison Center Utilization in Western Pennsylvania | Clinical Toxicology (2016)

Medication drug exposures among young children continue to rise despite current poison prevention efforts. These exposures result in increased healthcare utilization and medical costs. New tactics are needed to reduce injuries related to pediatric drug exposures. Authors analyzed 26,685 pharmaceutical drug exposures involving children less than five years of age based on calls reported to the Pittsburgh Poison Center from 2006-2010. They performed spatial statistics to assess for clustering and used logistic regression to estimate population characteristics associated with clustering. The study found that pediatric drug exposures do exist in discrete geographic clusters and with distinct socioeconomic characteristics.

<http://www.tandfonline.com/doi/abs/10.3109/15563650.2015.1113543>

Trends in Emergency Department Visits for Unsupervised Pediatric Medication Exposures, 2004-2013 | Pediatrics (2015)

After reports of increasing emergency department (ED) visits for unsupervised pediatric medication exposures in the 2000s, renewed efforts to improve safety packaging and education were initiated. National data on current trends can help further target interventions. The study found that targeting prevention efforts based on harm frequency and intervention feasibility can lead to continued reductions in ED visits for pediatric medication exposures.

<http://pediatrics.aappublications.org/content/early/2015/09/01/peds.2015-2092>

Toxico-Surveillance of Infant and Toddler Poisonings in the U.S. | Journal of Medical Toxicology (2012)

This article aims to describe the Toxicology Investigators Consortium (ToxIC) Case Registry as a tool for toxico-surveillance of infant and toddler poisonings in the U.S.. The report found that the most common ingested compounds were highly toxic-cardiac drugs, psychotropics, recreational drugs, alcohols, and controlled narcotic drugs, analgesics, and cleaning compounds, in that order.

<http://link.springer.com/article/10.1007%2Fs13181-012-0227-1>



Unintentional Child Poisonings Treated in U.S. Hospital Emergency Departments: National Estimates of Incident Cases, Population-Based Poisoning Rates, and Product Involvement | Pediatrics (2008)

This study developed national estimates of unintentional child poisoning cases treated in U.S. hospital emergency departments, to determine population-based poisoning rates, and to evaluate characteristics of the victims and the products involved. The study found that approximately 59.5% of the poisonings involved oral prescription drugs, oral nonprescription drugs, or supplements. Other major product categories resulting in poisonings included cleaning products, drugs and ointment preparations intended for external use, and personal care products. Approximately 70% of the poisonings involved children one or two years of age.

<http://pediatrics.aappublications.org/content/122/6/1244.abstract>

Unintentional Pediatric Ingestion Poisonings and the Role of Imitative Behavior | Injury Prevention (2011)

This study was conducted in order to quantify the relationship between imitative behaviors and poisonings in children. The premise of the study is that oral drug poisonings can result from children observing and imitating adult behavior, but that non-drug poisonings generally do not, as children do not witness adults ingesting non-drug substances.

http://injuryprevention.bmj.com/content/18/2/103.short?g=w_injuryprevention_current_tab

U.S. Poison Control Center Calls for Infants Six Months of Age and Younger | Pediatrics (2016)

Anticipatory guidance and prevention efforts to decrease poisonings in young children have historically focused on restricting access to minimize exploratory ingestions. Because infants through six months of age have limited mobility, such exposures are expected to be less frequent and therapeutic (or dosing) errors should be more frequent. Although recent prevention efforts target some types of therapeutic errors, the epidemiology of these exposures is not well characterized in this age group. This could have important implications for the effectiveness of current prevention efforts.

<http://pediatrics.aappublications.org/content/early/2016/01/12/peds.2015-1865>



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www.ChildrensSafetyNetwork.org

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