

Pediatric Drug Poisoning Is on the Rise

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STORY AT-A-GLANCE

- › Between 2001 and 2008, 453,559 children aged 5 or younger were admitted to a health care facility following exposure to a potentially toxic dose of a pharmaceutical drug
- › Between 2001 and 2008, unintentional drug poisonings in children aged 5 and younger rose 22%
- › Prescription medications were responsible for 71% of serious injuries, with opioids, sedative-hypnotics and cardiovascular drugs topping the list of drugs causing serious harm
- › 51.5% of unintentional drug poisoning cases in children involved drugs accessed as a result of having been removed from its original childproof packaging
- › In 49.3% of cases involving attention deficit hyperactivity disorder medications and 42.6% of cases involving an opioid, the drug was left out in the open

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Aside from causing a wide variety of side effects in those who take medications, the widespread routine use of pharmaceuticals also pose a serious risk to children who get their hands on them.

As of 2016, nearly half the U.S. population was on at least one medication.^{1,2} Twenty-four percent used three or more drugs, and 12.6% were on more than five different

medications.³ According to the 2016 National Ambulatory Medical Care Survey, 73.9% of all doctor's visits also involved drug therapy.⁴

As one would expect, drug use dramatically increases with age. As of 2016, 18% of children under 12 were on prescription medication, compared to 85% of adults over the age of 60. While this trend is troubling enough, with prescription drugs now being a staple in most homes, the number of children suffering accidental poisoning is also on the rise.

Medications Pose Serious Risks to Young Children

In September 2021 U.S. News and World Report announced that pediatric poisonings had risen dramatically during the pandemic.⁵ For example, Children's Hospital of Philadelphia saw the number double just in the second half of 2020. The reason, health officials believe, is that with more people working from home, they have become more distracted or forgetful with their medicines than usual.

Unfortunately, pediatric poisonings have been rising for several years. According to a 2012 article^{6,7} in *The Journal of Pediatrics* that reviewed patient records from the National Poison Data System of the American Association of Poison Control Centers, 453,559 children aged 5 or younger were admitted to a health care facility following exposure to a potentially toxic dose of a pharmaceutical drug between 2001 and 2008.

In that time, drug poisonings rose 22%. Ninety-five percent of cases were due to self-exposure, meaning the children got into the medication and took it themselves, opposed to being given an excessive dose by error.

Forty-three percent of all children admitted to the hospital after accidentally ingesting medication ended up in the intensive care unit, and prescription (opposed to over-the-counter) medications were responsible for 71% of serious injuries, with opioids, sedative-hypnotics and cardiovascular drugs topping the list of drugs causing serious harm. As noted by the authors:⁸

"Prevention efforts have proved to be inadequate in the face of rising availability of prescription medications, particularly more dangerous medications."

Keep All Drugs in Childproof Containers

If you're older, you may recall your parents or grandparents would have a lockable medicine cabinet where drugs were stored. Few people keep their medications in locked cabinets or boxes these days, failing to realize the serious risk they pose to young children.

The hazard is further magnified if you sort your medications into easy-open daily pill organizers rather than keeping each drug in its original childproof container.

A 2020 paper^{9,10} in The Journal of Pediatrics, which sought to "identify types of containers from which young children accessed solid dose medications during unsupervised medication exposures" found 51.5% involved drugs accessed as a result of having been removed from its original childproof packaging.

Remarkably, in 49.3% of cases involving attention deficit hyperactivity disorder medications and 42.6% of cases involving an opioid, the drug was not in any container at all when accessed. In other words, the child found the pill or pills just laying out in the open. In 30.7% of all cases where a child ingested a drug, the exposure involved a grandparent's medication. As noted by the authors:

"Efforts to reduce pediatric SDM [solid dose medication] exposures should also address exposures in which adults, rather than children, remove medications from child-resistant packaging."

Packaging/storage innovations designed to encourage adults to keep products within child-resistant packaging and specific educational messages could be targeted based on common exposure circumstances, medication classes, and medication intended recipients."

Teen Drug Overdoses Are Also on the Rise

While infants are notorious for putting anything and everything in their mouth, making them particularly vulnerable to accidental drug exposures, drug overdoses, particularly those involving opioids and benzodiazepines, are also becoming more prevalent among teens with access to these drugs.

According to a 2019 study¹¹ published in the journal *Clinical Toxicology*, 296,838 children under the age of 18 were exposed to benzodiazepines between January 2000 and December 2015. Over that time, benzodiazepine exposure in this age group increased by 54%. According to the authors:¹²

"The severity of medical outcomes also increased, as did the prevalence of co-ingestion of multiple drugs, especially in children ages 12 to <18 years. Nearly half of all reported exposures in 2015 were documented as intentional abuse, misuse, or attempted suicide, reflecting a change from prior years ...

Medical providers and caretakers should be cognizant of this growing epidemic to avoid preventable harm to adolescents, young children, and infants."

A similar trend has been found with opioids. A 2017 study¹³ looking at prescription opioid exposures among children and adolescents in the U.S. between 2000 and 2015 found:

"Poison control centers received reports of 188,468 prescription opioid exposures among children aged <20 years old from 2000 through 2015 ... Hydrocodone accounted for the largest proportion of exposures (28.7%), and 47.1% of children exposed to buprenorphine were admitted to a health care facility (HCF).

The odds of being admitted to an HCF were higher for teenagers than for children aged 0 to 5 years or children aged 6 to 12 years. Teenagers also had greater odds of serious medical outcomes ... The rate of prescription opioid-

related suspected suicides among teenagers increased by 52.7% during the study period."

Commonsense Precautions

The U.S. Centers for Disease Control and Prevention promotes and supports the Up and Away and Out of Sight campaign, which centers “around several simple, data-driven actions that parents and caregivers can take to prevent medication overdoses in the children they care about and care for.”¹⁴ These commonsense precautions include the following:¹⁵

- Store your medications (and supplements) in their original packaging in a place your child cannot reach. Don't store medications in your nightstand, purse or end table where little hands are likely to explore and find them. Any medication stored in the refrigerator should be in childproof packaging. Also make sure drugs are safely stored in areas your child visits frequently, such as a grandparent's house or a baby sitter.
- Put all medications away after each use.
- Make sure to relock the safety cap after each use.
- Teach your children about medicine safety; never tell them medicine is "like candy" in order to get them to take it.
- Remind guests to place bags, purses and coats that have medicine in them in a safe place while visiting.

What to Do in Case of Accidental Drug Exposure

Be sure to keep the Poison Help number in your phone, and make sure your baby sitter or caregiver has it. In the U.S., the Poison Help number is 800-222-1222. If you suspect your child has taken a prescription or OTC medication, even if he or she is not yet exhibiting symptoms, call the Poison Help line immediately.

If you're unsure what medication your child may have taken, call 911 or the emergency number in your area for transportation to the nearest medical facility. Although your child may appear fine in the initial minutes, this can rapidly change. You want to start treatment as soon as possible to reduce the risk of permanent damage or potential death.

Remember to bring with you the names of any medications your child may have accidentally ingested, as well as any medications your child has taken in the past 24 hours as prescribed by their doctor, any allergies they have, and any changes or symptoms you may have observed.

Unfortunately, symptoms of a medication overdose can vary widely, depending on the drug, dosage and age of the child. That said, symptoms of an overdose may include:¹⁶

Nausea	Vomiting or diarrhea
Drooling or dry mouth	Convulsions
Pupils that grow larger or shrink	Sweating
Loss of coordination and/or slurred speech	Extreme fatigue
Yellow skin or eyes	Flu-like symptoms
Unusual bleeding or bruising	Abdominal pain
Numbness	Rapid heartbeat

Should your child exhibit any of the following symptoms, call 911 (in the U.S.) immediately:¹⁷

Won't wake up	Can't breathe
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Twitches or shakes uncontrollably

Displays extremely strange behavior

Has trouble swallowing

Develops a rapidly spreading rash

Swells up in the face, including around the lips and tongue

Opioid Epidemic Takes Toll on Pediatric Population

It's crucial to realize that many drugs can be life threatening to a young child, even in low doses. This is particularly true for opioids and buprenorphine, a drug used to treat opioid dependence. As noted in a 2005 paper¹⁸ on opioid exposure in toddlers:

"Ingestions of opioid analgesics by children may lead to significant toxicity as a result of depression of the respiratory and central nervous systems. A review of the medical literature was performed to determine whether low doses of opioids are dangerous in the pediatric population under 6 years old.

Methadone was found to be the most toxic of the opioids; doses as low as a single tablet can lead to death. All children who have ingested any amount of methadone need to be observed in an Emergency Department (ED) for at least 6 h and considered for hospital admission.

Most other opioids are better tolerated in ingestions as small as one or two tablets. Based on the limited data available for these opioids, we conclude that equianalgesic doses of 5 mg/kg of codeine or greater require 4 to 6 h of observation in the ED.

Data for propoxyphene and all extended-release preparations are limited; their prolonged half-lives would suggest the need for longer observation periods. All opioid ingestions leading to respiratory depression or significant central nervous system depression require admission to an intensive care unit."

Similarly, a 2006 paper¹⁹ on the adverse effects of unintentional buprenorphine exposure in children noted that:

"Buprenorphine in sublingual formulation was recently introduced to the American market for treatment of opioid dependence. We report a series of 5 toddlers with respiratory and mental-status depression after unintentional buprenorphine exposure.

Despite buprenorphine's partial agonist activity and ceiling effect on respiratory depression, all children required hospital admission and either opioid-antagonist therapy or mechanical ventilation ...

The increasing use of buprenorphine as a home-based therapy for opioid addiction in the United States raises public health concerns for the pediatric population."

The take-home message here is that as drug treatment increases and becomes ever-more prevalent among all age groups, the risk of unintentional exposure increases as well. Toddlers will stick just about anything in their mouth, and young children will often not recognize there's a difference between pills and candy.

As parents and caregivers, we simply must take the necessary precautions to keep all medications in a safe place, well out of reach of curious hands. Failure to safeguard your medications can have profoundly tragic consequences, so please, do not take this matter lightly.

Sources and References

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- ⁸ [The Journal of Pediatrics February 2012; 160\(2\): 265-270.el, Conclusions](#)
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