



Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

2017 ANNUAL REPORT

www.mdpoison.com
1-800-222-1222



61% of calls about teens and 48% of calls about adults are related to intentional exposures.

From the Director

Greetings!

I am proud to share with you the Maryland Poison Center's (MPC) 2017 Annual Report, which represents the end of a service milestone



for the MPC. We celebrated 45 years of service in 2017, and my how things have changed! It's fascinating to look back at where you've been to figure out where you are and how far you've come.

Where we are right now seems to be at a period of transition. We've seen major shifts in the types of calls reported to the MPC over time. The total number of human exposures has not varied much, but the victims of poisoning have changed dramatically. In the MPC's early years, more than 60 percent of poisoning victims were children under the age of six. In 2017, that population represents just 40 percent of our calls.

If the overall number of poisoning victims isn't changing but the victims are changing, that has broad implications for the service. What we are seeing now (and this phenomenon is also being seen nationally) is that the percentage of poisoning victims with intentional overdoses (individuals attempting suicide or those trying to get high) has increased. Intentional overdose patients are a very different type of patient than pediatric unintentional exposures. Intentional overdose cases tend to occur later in the day compared to pediatric cases, and these cases are often clinically very challenging. The vast majority of intentional overdose cases require multiple interactions with the emergency

department and intensive care unit. The chances of needing additional specialty consultation are greater. These cases require a great deal more time, both in direct consultation and in documentation and coding. Because of the increased workload, we've hired additional staff. Because of when these cases typically occur, we've shifted the hours that our certified specialists in poison information are staffing the service in order to meet demand.

Like every other health service, we've seen and have been impacted by the challenges associated with the national opioid epidemic. The MPC has been working with the Maryland Department of Health over the past several years to help provide perspective and data about the cases we are seeing in our state. We've developed coding processes to capture instances of bystander administered naloxone. We've developed reporting processes to get summary information on bystander naloxone cases to state and local health departments on a weekly basis. And we're now working with the state and local health departments, local police departments, and other organizations that are training people on how to use naloxone to consolidate bystander naloxone reporting in the state.

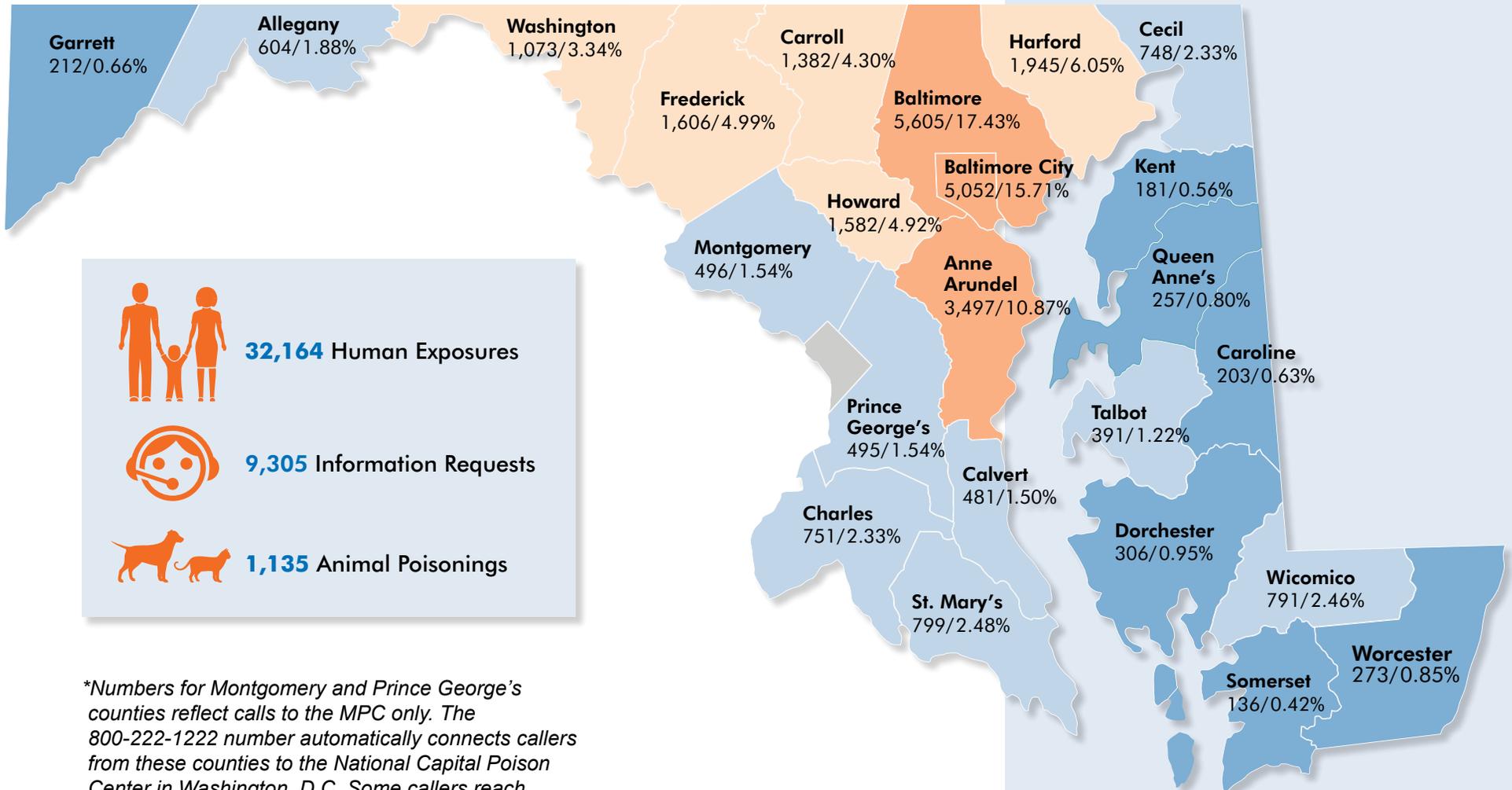
Things have changed greatly over the past 45 years. What has not changed over time is the MPC's mission: to decrease the cost and complexity of care while maintaining and/or improving outcomes.

In short, we save lives and save dollars.

Bruce D. Anderson, PharmD, DABAT, FAACT
Executive Director
Maryland Poison Center
Professor of Pharmacy Practice and Science
University of Maryland School of Pharmacy

Human Exposures

In 2017, the Maryland Poison Center received 42,604 calls.



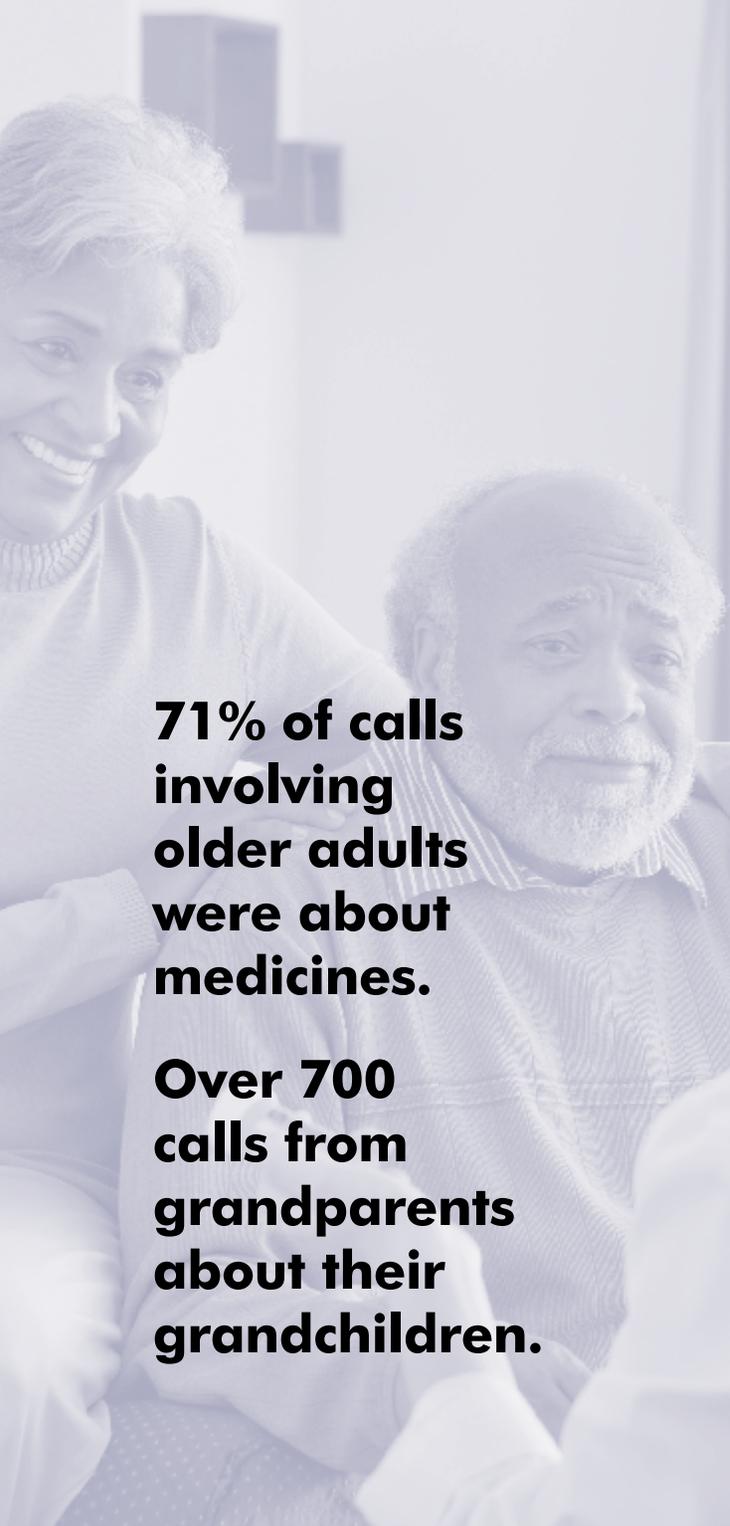
**Numbers for Montgomery and Prince George's counties reflect calls to the MPC only. The 800-222-1222 number automatically connects callers from these counties to the National Capital Poison Center in Washington, D.C. Some callers reach the MPC by dialing local telephone numbers still in service.*

Callers from unknown Maryland counties and from other states accounted for 10.2% of the human exposures in 2017.

The data for counties are as accurate as possible given that some ZIP codes cross county boundaries.



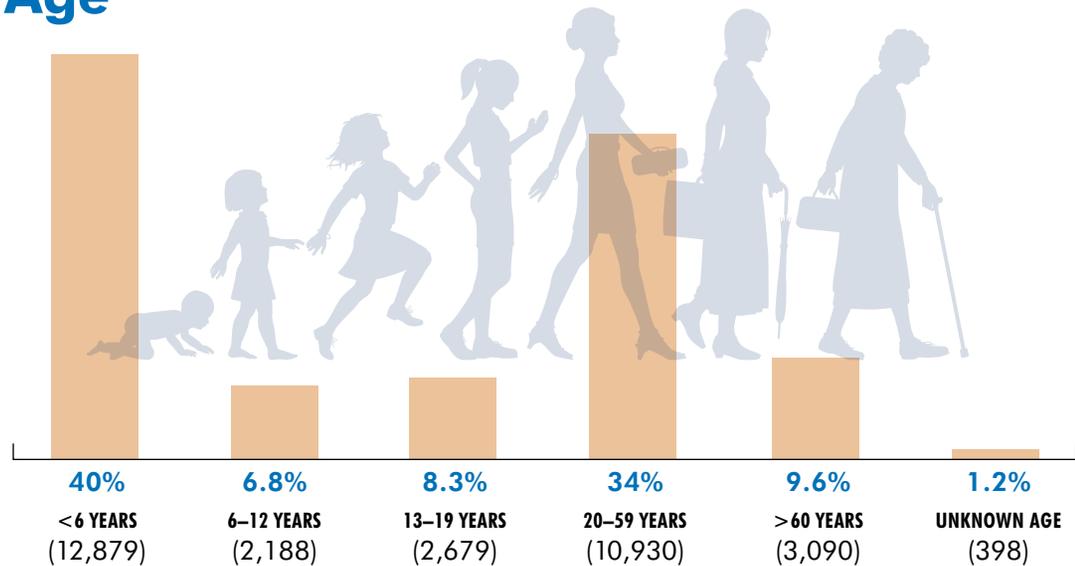
71% of exposure calls were unintentional.



71% of calls involving older adults were about medicines.

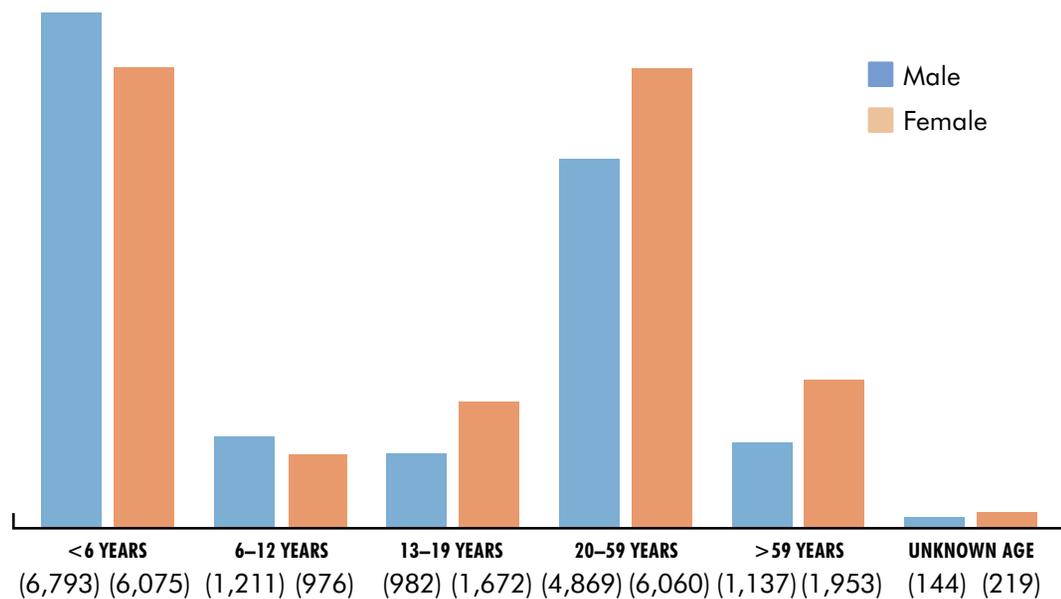
Over 700 calls from grandparents about their grandchildren.

Age



Gender

47.1 percent of exposures occurred in males, and 52.7 percent in females (0.2 percent unknown).



Site of Caller



Residence
61.8% (19,865)



Health Care Facility
24.5% (7,896)



EMS Provider
5.6% (1,805)



Other/Unknown
4.7% (1,523)



**School/
School Nurse**
2.7% (858)



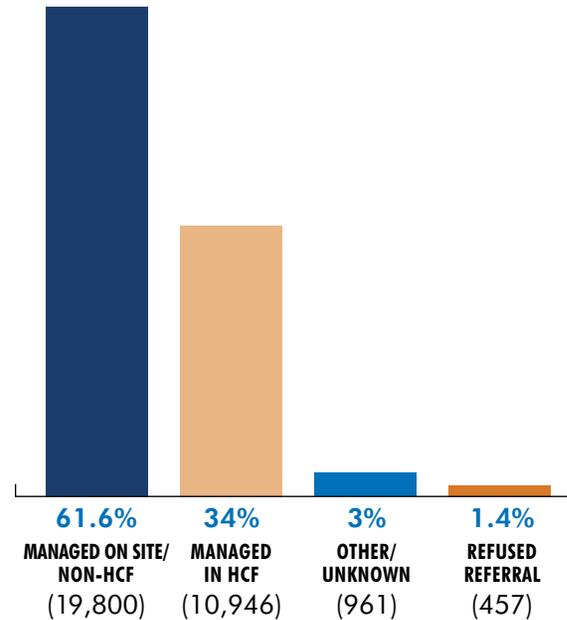
Workplace
0.7% (217)

Residence can be the patient's residence or another residence.

Health care facilities include hospitals, doctor's offices, urgent care centers, clinics, and others.

Emergency medical services providers include EMS, paramedic, first responder, and emergency medical dispatcher (911 dispatcher).

MPC Safely Manages Patients at Home



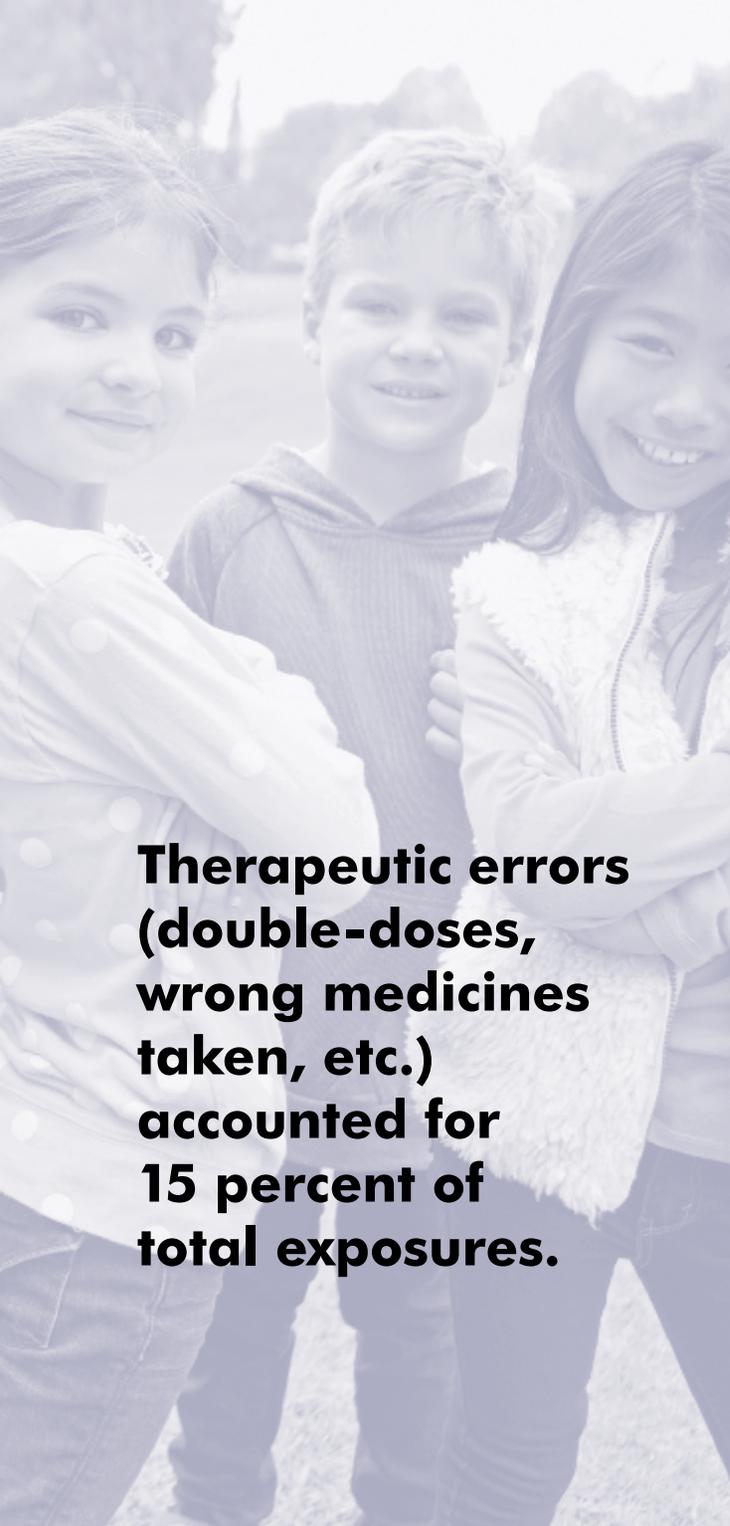
Managing cases safely at home:

- Saves millions of dollars in unnecessary health care costs compared with managing patients in a health care facility
- Allows more efficient and effective use of limited health care resources

In fact, when EMS providers or 911 consult with the MPC about patients, 15 percent of those patients are not taken to a health care facility based on poison center advice because they can be managed safely at home.

Of the cases managed in a health care facility...

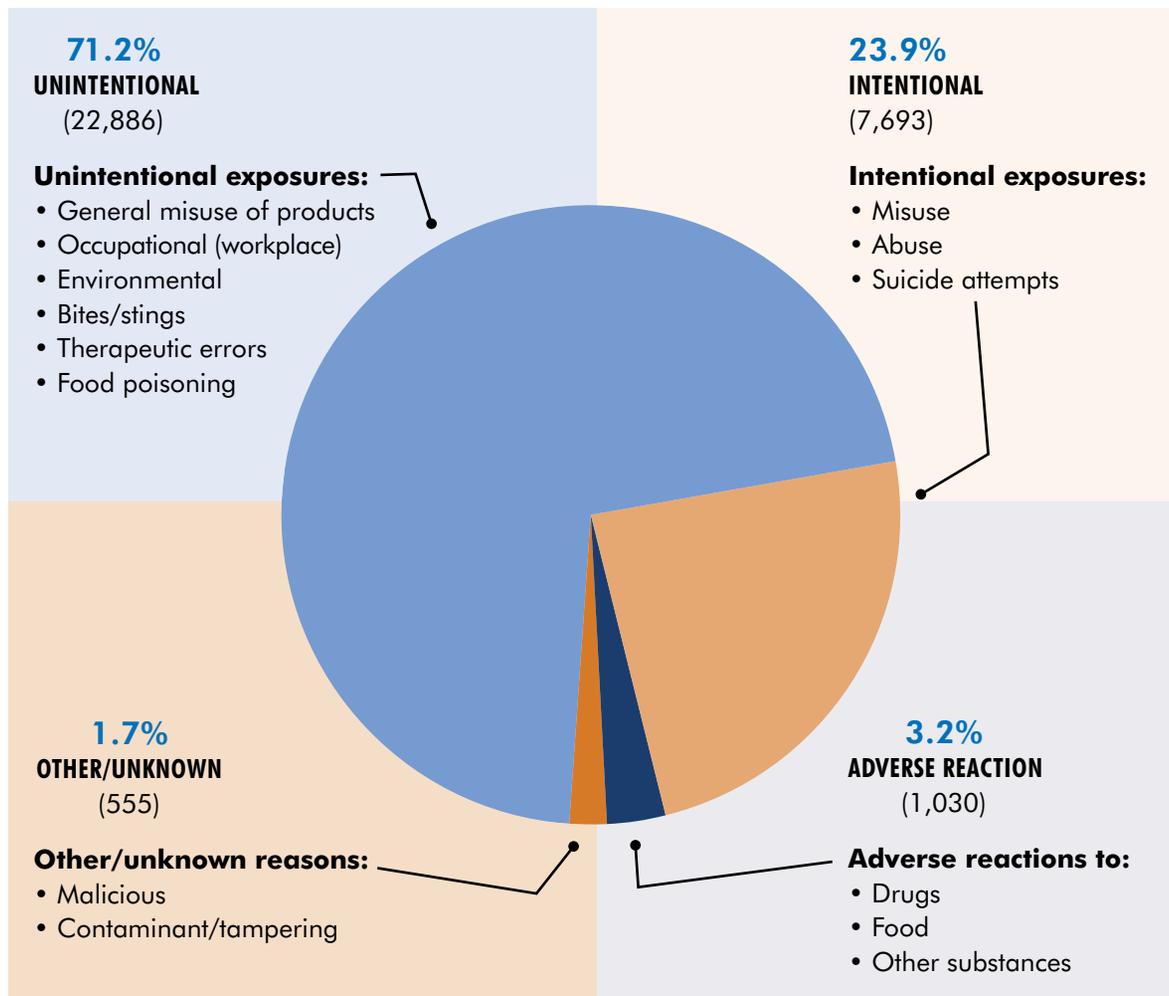
- 55 percent were treated and released
- 9 percent were admitted to a critical care unit
- 13 percent were admitted to a non-critical care unit
- 17 percent were admitted for psychiatric treatment
- 6 percent were lost to follow-up



Therapeutic errors (double-doses, wrong medicines taken, etc.) accounted for 15 percent of total exposures.

Circumstance

The people who contact the MPC have several different reasons for calling.



The reason for poison exposures differs by age. In young children (under 6 years), 99 percent of exposures are unintentional, while in teens (13-19 years), only 32 percent of exposures are unintentional. Exposures in adults (20-59 years) are split more evenly with 44 percent being unintentional and 48 percent being intentional. In tweens (6-12 years) and older adults (60 years and older), most exposures are unintentional (85 percent and 73 percent respectively).

Route of Exposure*



Ingestion

81.7% (26,277)



Ocular

4.6% (1,481)



Dermal

7.3% (2,333)



Bite/Sting

1.1% (343)



Inhalation

6.6% (2,131)

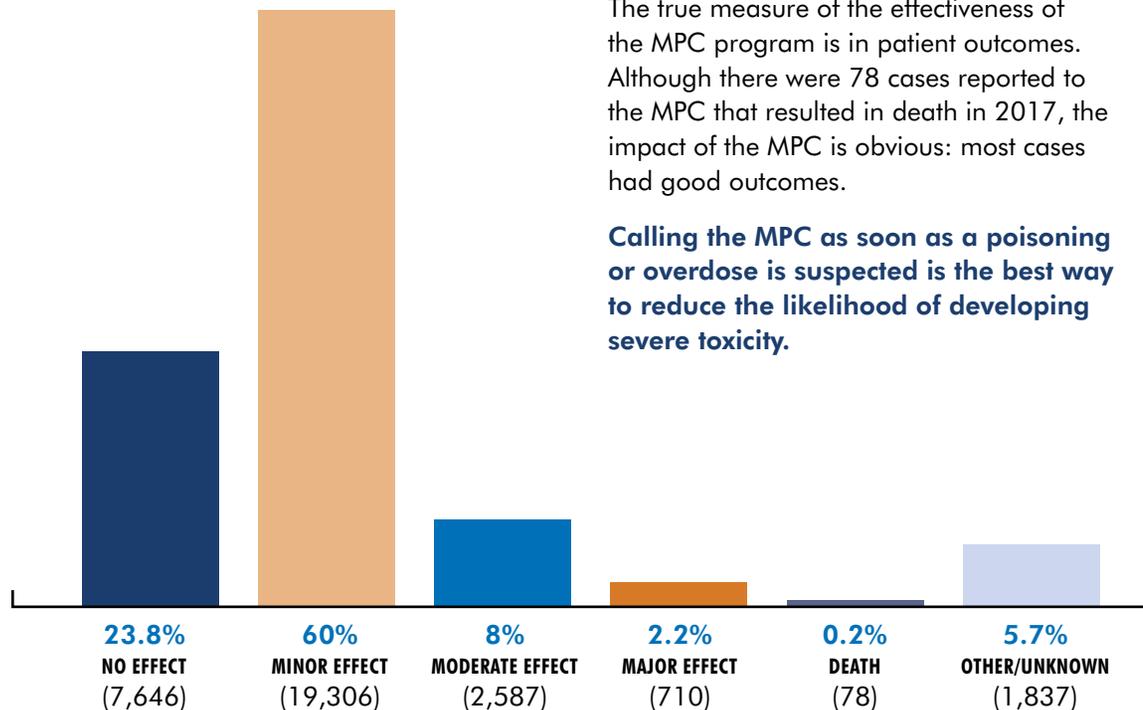


Other

4.3% (1,385)

*Some cases involved multiple routes of exposure. Percentages in the chart are based on the total number of human exposures.

Outcomes



The true measure of the effectiveness of the MPC program is in patient outcomes. Although there were 78 cases reported to the MPC that resulted in death in 2017, the impact of the MPC is obvious: most cases had good outcomes.

Calling the MPC as soon as a poisoning or overdose is suspected is the best way to reduce the likelihood of developing severe toxicity.



Our mission is to decrease the cost and complexity of care while maintaining and/or improving patient outcomes. These data clearly show that we're fulfilling our mission.

Substances Involved in Poisonings

The tables below list the most common substances involved in poisonings and overdoses reported to the MPC in 2017. A patient may be exposed to more than one substance in a poisoning or overdose case.

TOP 10 DRUG SUBSTANCES	No.	%
Analgesics	4,962	15.4%
Sedatives/Hypnotics/ Antipsychotics	2,978	9.3%
Antidepressants	2,353	7.3%
Stimulants/Street Drugs	2,081	6.5%
Cardiovascular Drugs	1,993	6.2%
Antihistamines	1,687	5.2%
Anticonvulsants.....	1,230	3.8%
Hormones (including diabetes and thyroid medicines)	1,012	3.1%
Cold and Cough Medicines..	857	2.7%
Vitamins.....	855	2.7%
Others.....	5,896	18.3%
TOTAL.....	25,904	80.5%
Total Human Exposures	32,164	

TOP 10 NON-DRUG SUBSTANCES	No.	%
Cleaning Substances (Household).....	2,682	8.3%
Cosmetics/ Personal Care Products	2,662	8.3%
Foreign Bodies/ Toys/Miscellaneous	1,386	4.3%
Alcohols	1,364	4.2%
Pesticides.....	1,042	3.2%
Plants.....	603	1.9%
Chemicals	563	1.8%
Arts/Crafts/Office Supplies ...	523	1.6%
Hydrocarbons.....	416	1.3%
Fumes/Gases/Vapors.....	413	1.3%
Others.....	3,624	11.3%
TOTAL.....	15,278	47.5%
Total Human Exposures	32,164	

Percentages in the tables are based on the total number of human exposures.

Some 80.5 percent of the poisoning and overdose calls to the MPC involved a drug, while 47.5 percent of calls involved a non-drug substance.

Satisfied Callers

Public:

Michelle wrote on Facebook in February 2017: *"Had to call today for my daughter. Just wanted to give a big THANK YOU to Chris. He was very quick, informative, and very helpful!"*

Becky wrote on Facebook in May 2017: *"Thank you to Randy for telling me that my dog would be OK after she licked WD40 off the hinges of our screen door. The warning label on the product was scary, but he put me at ease. Dogs move just as fast as toddlers!"*

Dan replied to the MPC Caller Satisfaction Survey in November 2017:

"Keep up the good work. Denise was very helpful with my problem. It helps to hear a friendly voice."

Health care professionals:

Anonymous response to MPC Health Care Professional Survey in December 2017: *"I think you do an excellent job, and I am glad you are there as a resource."*

Health Professional Education

Professional education is designed to help clinicians better manage poisoning and overdose cases that end up in a health care facility. The MPC also provides on-site training for physicians, pharmacists, and EMS providers.

PROGRAM SPOTLIGHT:

Critical Care Nursing Consortium

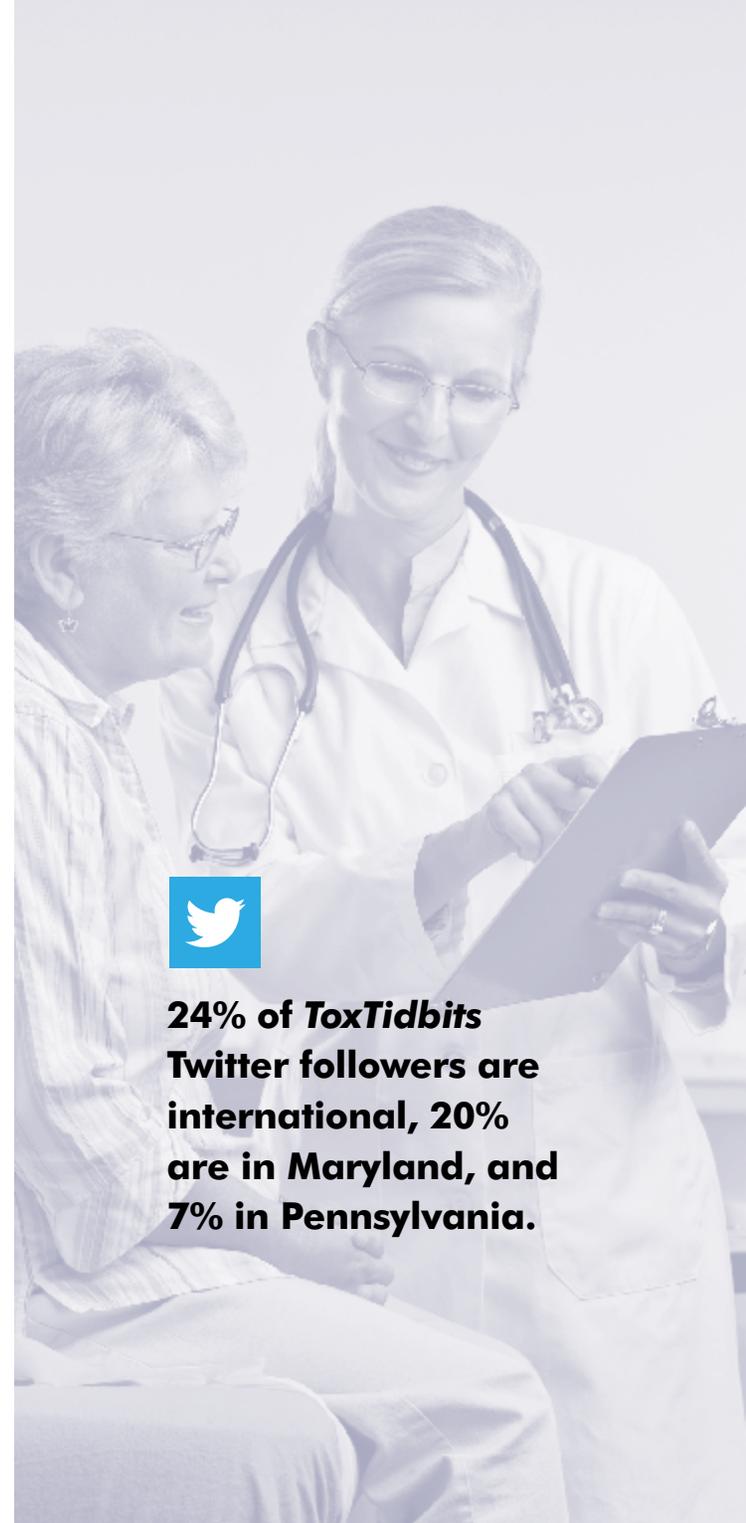
The MPC is a partner in the Chesapeake Critical Care Consortium, which consists of representatives of 15 Baltimore metropolitan hospitals who come together to provide a critical care course for nurses. The course is held six times each year, and each course consists of seven days of classes that are open to nurses from any of the participating hospitals. In-depth education sessions provide the nurse attendees with an understanding of diseases, nursing assessment, and treatment modalities. Topics include cardiac dysfunction, ECG interpretation, hemodynamic monitoring, pulmonary disorders, and other important topics including toxicology.

Critical care nurses are often confronted with patients who have been hospitalized due to an overdose or poisoning. A basic understanding of what to expect and what specific treatments are available helps the nurse to provide the best care possible. In addition, learning how and why the critical care nurse should consult with the MPC results in a team approach to caring for the patient. The MPC has provided speakers for every critical care nursing course since 2004, educating more than 3,500 nurses about toxicology. In 2017, approximately 270 nurses attended toxicology classes at six Chesapeake Critical Care Nurse Consortium courses.

The MPC's Twitter account for health care professionals ([@MPCToxTidbits](https://twitter.com/MPCToxTidbits)) posted clinical and medical toxicology content relevant for health care providers. 346 tweets leading to 129,282 impressions and 3,531 engagements.

125 health professionals came to the MPC in 2017 to learn about the assessment and treatment of poisoned patients

36 programs and webinars reached more than 10,000 health care professionals



24% of ToxTidbits Twitter followers are international, 20% are in Maryland, and 7% in Pennsylvania.

Public Education

Our focus:

1. Increase awareness of the poisons found in every home, business, and school.
2. Help prevent poisonings from occurring by encouraging safe storage and proper use of household products and medicines.
3. Highlight the expertise of the staff of the MPC and that calling will result in the right answer, right away, 24/7.

PROGRAM SPOTLIGHT:

Older Adult Medicine Safety Program

During the 2016-2017 academic year, the MPC initiated a student ambassador program. Through this new program, a select group of second-year pharmacy students from the University of Maryland School of Pharmacy learned how to present a medicine safety program to older adults in Baltimore City and Baltimore County senior centers and senior apartments. The program, titled "Are You Taking Your Medicine Safely," provides background information on older adults and medicine usage and includes an interactive presentation using a fictitious couple who have various medication situations to work through. All attendees received medicine safety handouts, a medicine tracker, phone stickers, a magnet, and a magnifier.

In 2017, five students presented 24 programs to more than 180 older adults. Overall, there was an improvement in knowledge in all areas. Pre-program, 43 percent of the older adults said they had the MPC phone number posted, but after the program, 83 percent said they would make sure they posted it in a visible location. About 97 percent of the attendees said they would recommend the program. About half said they learned "a lot" of new information, while 40 percent learned "some" new information.

One student visited a senior apartment building where half of the residents speak English and the other half speak Korean. She presented the program one day in English, then went back another day to do the presentation in Korean. She even translated the educational materials into Korean for her audience.

The program was a great success. It provided important information to the older adults and provided an excellent learning experience for the pharmacy students. The plan is to continue to recruit new student ambassadors and expand the program to other areas in Maryland.

"The 'Are You Taking Your Medicine Safely' program offered at the Baltimore County Department of Aging (BCDA) Senior Centers has been a wonderful asset for the seniors of Baltimore County. The participants have shared how beneficial the class was and how much they didn't know about medication safety but do now thanks to the student ambassadors enlightening them." DONNA BILZ, BCDA Program Coordinator, Senior Center Division

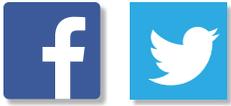


**50 programs in
12 counties attended
by 2,648 people.**



**More than 175,000
pieces of educational
materials distributed.**

Social Media and Website



In an attempt to reach more Marylanders with our educational and awareness messages, the MPC expanded its social media presence in 2017. The number of Facebook ([facebook.com/MarylandPoisonCenter](https://www.facebook.com/MarylandPoisonCenter)) posts increased, and a new Twitter account (@MDPoisonCtr), YouTube channel (www.youtube.com/channel/UCvxm0BHJUD8FsG11u6gh6xA), and e-Antidote blog (blog.mdpoison.com) were created.



25% increase in Facebook followers

72% of MPC Facebook followers are female

Traditional Media

In 2017, the MPC and/or staff appeared in the media at least 49 times. The coverage included web (42), TV (4), and radio (3). In July, the MPC issued a press release communicating the number of snakebites had returned to normal in 2017 despite lower numbers in 2015 and 2016. In total, the release generated at least 30 media mentions across Maryland and Washington, DC news outlets. The MPC was also referenced in seven stories related to the opioid crisis, including overdose reports, the perceived threat of synthetic opioids to emergency responders, and naloxone distribution.



YouTube Channel has five new original videos with approximately 2,000 views for a total watch time of just under 37 hours.



Nearly 22,300 people visited the MPC website yielding nearly 55,000 pageviews.

ToxTidbits and Poison Prevention Press

ToxTidbits Maryland Poison Center
 October 2017 Poison Center Hotline: 1-800-222-1222
 The Maryland Poison Center's Monthly Update: News, Advances, Information

Acute Cyanide Toxicity from Amygdalin
 The husband of a woman who made a smoothie out of 2-3 apricots, pits and all, called the Maryland Poison Center. She was asymptomatic, but he was worried about possible cyanide toxicity. Is there cause for concern?

Sources of Cyanogenic Glycosides
 Cyanogenic glycosides such as amygdalin, prunasin and linamarin are in some plant species. The most common plant source is the Prunus genus, which includes apricot, plum, peach, cherry laurel, choke cherry and bitter almond. Other plant sources include apple, cassava, wild cherry, hydrangea, pear and some lima beans. The cyanide content varies greatly depending on plant, plant part, season and geographic location. For example, the toxin is in the pit kernel for Prunus genus and in the flower bud for Hydrangea.

Lactile, also known as vitamin B17, is a semi-synthetic form of amygdalin isolated from the seeds of apricots. Clinical data does not support claims that it is of benefit for cancer. Banned in the U.S. by the FDA due to lack of effectiveness and potential for serious adverse effects, it is still possible to buy lactile on the internet. Fruit kernels can also be purchased on the internet and in health food stores as vitamin supplements.

Presentation and Toxicity
 Swallowing pits or seeds whole, without chewing, does not usually result in toxicity. Ingestion of large quantities of chewed seeds can cause cyanide poisoning. After chewing seeds, enzymatic hydrolysis of the cyanogenic glycoside to cyanide occurs in the GI tract, resulting in delays in onset of toxicity of up to 2 hours or more. Cyanide causes cellular hypoxia by inhibiting cytochrome oxidase in the final step of the mitochondrial electron transport chain. Vital sign abnormalities from cyanide include tachypnea, Kussmaul's respiration, respiratory arrest and hypotension. Patients experience vomiting, diarrhea, abdominal pain, dizziness, weakness, lightheadedness and cyanosis, which then can progress to coma, seizures, dysrhythmias and cardiovascular collapse.

Did you know?
 In cyanide poisoning, venous blood is bright red and skin may be pink or cherry red.

The bright red color of blood is due to elevated venous pO₂ and measured oxygen saturation. The cyanide antidote hydroxocobalamin causes a reddish color to skin and urine. Patients with cyanide poisoning may have a bitter almond smell, although only about 30% of people can detect this odor.

Continued on page 2

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Poison Prevention Press
 March/April 2017 Volume 10, Issue 1

A Closer Look at Lyme Disease
 According to the CDC, 95% of confirmed Lyme disease cases in 2015 were reported from 10 states. Maryland was one of the 10 states.

Bites and Stings
 As the temperatures get warmer, we begin to spend more time outside. Warmer weather also means insects and snakes start to appear. Let's review the critters we should be aware of in Maryland.

Did you know that...
 In 2015, there were 1,727 confirmed cases of Lyme disease reported to the state health department.
 In 2015, the CDC managed 107 cases involving a bite or sting.

Follow the MPC on Facebook & Twitter

Subscribe to Poison Prevention Press and read past issues at www.mdpoison.com

Visitors to the **ToxTidbits** page of the MPC website were from the US and more than 120 other countries.

ToxTidbits and Poison Prevention Press keep health care providers and community members up-to-date on poison-related topics.

The MPC publishes **Poison Prevention Press**, an e-newsletter for the general public, every other month. The newsletter highlights various poison safety topics for all ages. Topics presented in 2017 include "Carbon Monoxide," "Bites and Stings," "Household Objects and Substances," "Poison Myths," "Pre-teen and Teen Substance Use," and "Holiday Poison Hazards." **Poison Prevention Press** is sent to e-mail subscribers who are encouraged to post and share the newsletter with others.

ToxTidbits is a monthly newsletter for health professionals containing important toxicology information, updates, and news. Some of the topics addressed in 2017 include "Pediatric Buprenorphine Ingestion," "Promethazine Abuse: A Growing Problem?," "Abrin," "Black Widow Spider Bites," "Salicylate Poisoning," and "Hydrofluoric Acid." **ToxTidbits** is sent to email subscribers and faxed to every emergency department in our service area. **ToxTidbits: Antidote Facts** are short reviews of antidotes written by MPC staff and students. We also provide a list of recommended antidotes and stock levels for hospital pharmacies.

To receive **ToxTidbits** or **Poison Prevention Press** by email, visit www.mdpoison.com and click on "Receive Newsletter." Current and previous issues of both newsletters can be read and downloaded from the MPC website.

Research Presentations and Publications

Whittaker CF, Tom SE, **Bivens A, Klein-Schwartz W**. Evaluation of an Educational Intervention on Knowledge and Awareness of Medication Safety in Older Adults with Low Health Literacy. *American Journal of Health Education* 2017;48(2): 100-107.

Stassinis GL, **Gonzales L, Klein-Schwartz W**. Characterizing the Toxicity and Dose-effect Profile of Tramadol Ingestions in Children. *Pediatric Emergency Care*. 2017 Feb 21. [E-pub ahead of print].

Stassinis G, **Klein-Schwartz W**. Comparison of Pediatric Atypical Antipsychotic Exposures Reported to U.S. Poison Centers. *Clinical Toxicology* 2017; 55: 45-50.

Stassinis G, **Klein-Schwartz W**. Asenapine, Iloperidone and Lurasidone Exposures in Young Children Reported to U.S. Poison Centers. *Clinical Toxicology* 2017 Oct. 10, [E-pub ahead of print].

Sera L, Brown M, McPherson ML, Walker KA, **Klein-Schwartz W**. State Survey of Medical Boards Regarding Abrupt Loss of a Prescriber of Controlled Substances. *Journal of Opioid Management* 2017; 12(2): 105-110.

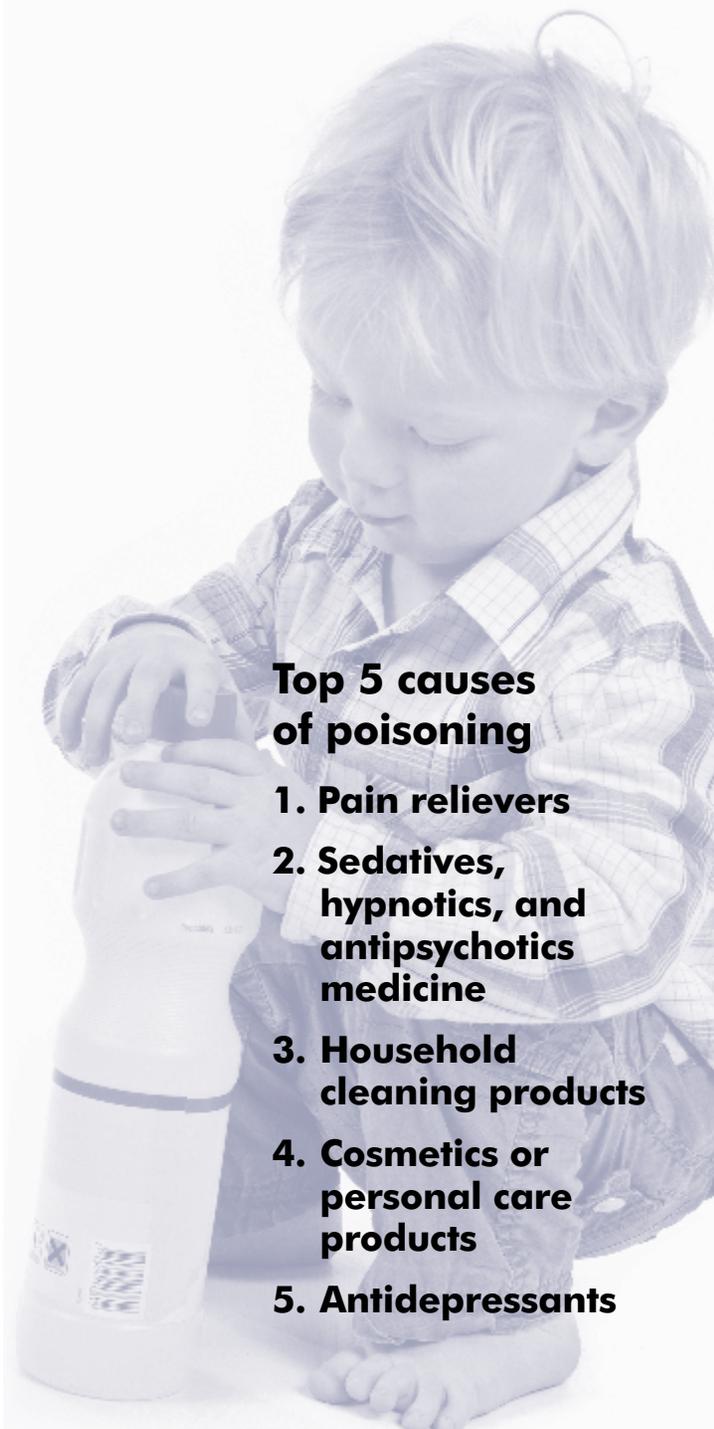
Biggs JM, Morgan JA, Lardieri AB, Kishk OA, **Klein-Schwartz W**. Abuse and Misuse of Selected Dietary Supplements Among Adolescents: A Look at Poison Center Data. *Journal of Pediatric Pharmacology and Therapeutics* 2017; 22(6): 385-393.

Anderson BD, Seung H, **Klein-Schwartz W**. Trends in Types of Calls Managed by U.S. Poison Centers 2000-2015. *Clinical Toxicology* 2017 Dec 05, [E-pub ahead of print].

Patel S, Poola-kella S, Munir K, **Kim H**. When Enigmatic Pheochromocytoma Bites Back: Metoclopramide-induced Pheochromocytoma in a Patient with Previously Undiagnosed Adrenal Mass. North American Congress of Clinical Toxicology, Vancouver, British Columbia, Oct. 13-15, 2017

Patel A, **Pennington WC**, O'Connor J, Liebelt E, Garrard A. Not For Kids - A "Hands Off" Harm Reduction Tool for Marijuana Edibles. American Public Health Association, Atlanta, GA. Poster. Nov. 4-8, 2017.

Leonard J, Fernandez A, Elko C. Pediatric Methadone Exposure: Poison Center Time Documentation of Dose and Clinical Effects. North American Congress of Clinical Toxicology, Vancouver, British Columbia, Canada. Poster. Oct. 13-15, 2017.



Top 5 causes of poisoning

1. Pain relievers
2. Sedatives, hypnotics, and antipsychotics medicine
3. Household cleaning products
4. Cosmetics or personal care products
5. Antidepressants



The MPC has been providing expert service to Marylanders since 1972.

Our pharmacists and nurses have more than 250 years of combined experience managing poisoning and overdose calls.

Maryland Poison Center Staff

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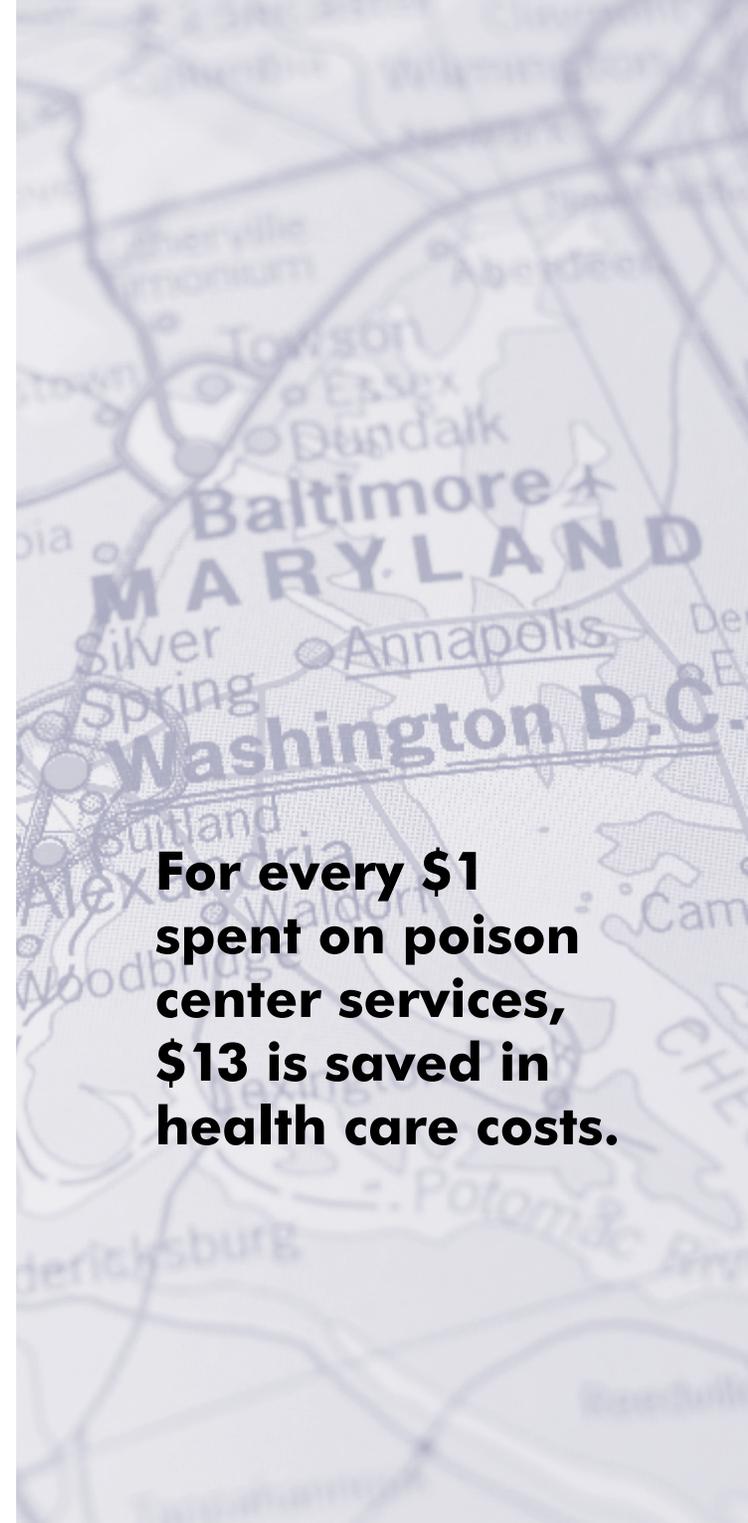
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- University of Maryland School of Pharmacy
- University System of Maryland
- Maryland Department of Health
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- Maryland Institute for Emergency Medical Services Systems (MIEMSS)
- Priority Partners MCO
- Safe Kids Maryland State and Local Coalitions
- PharmCon, Inc.
- Baltimore County Department of Aging
- Partnership for a Safer Maryland



**For every \$1
spent on poison
center services,
\$13 is saved in
health care costs.**



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can support the**

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