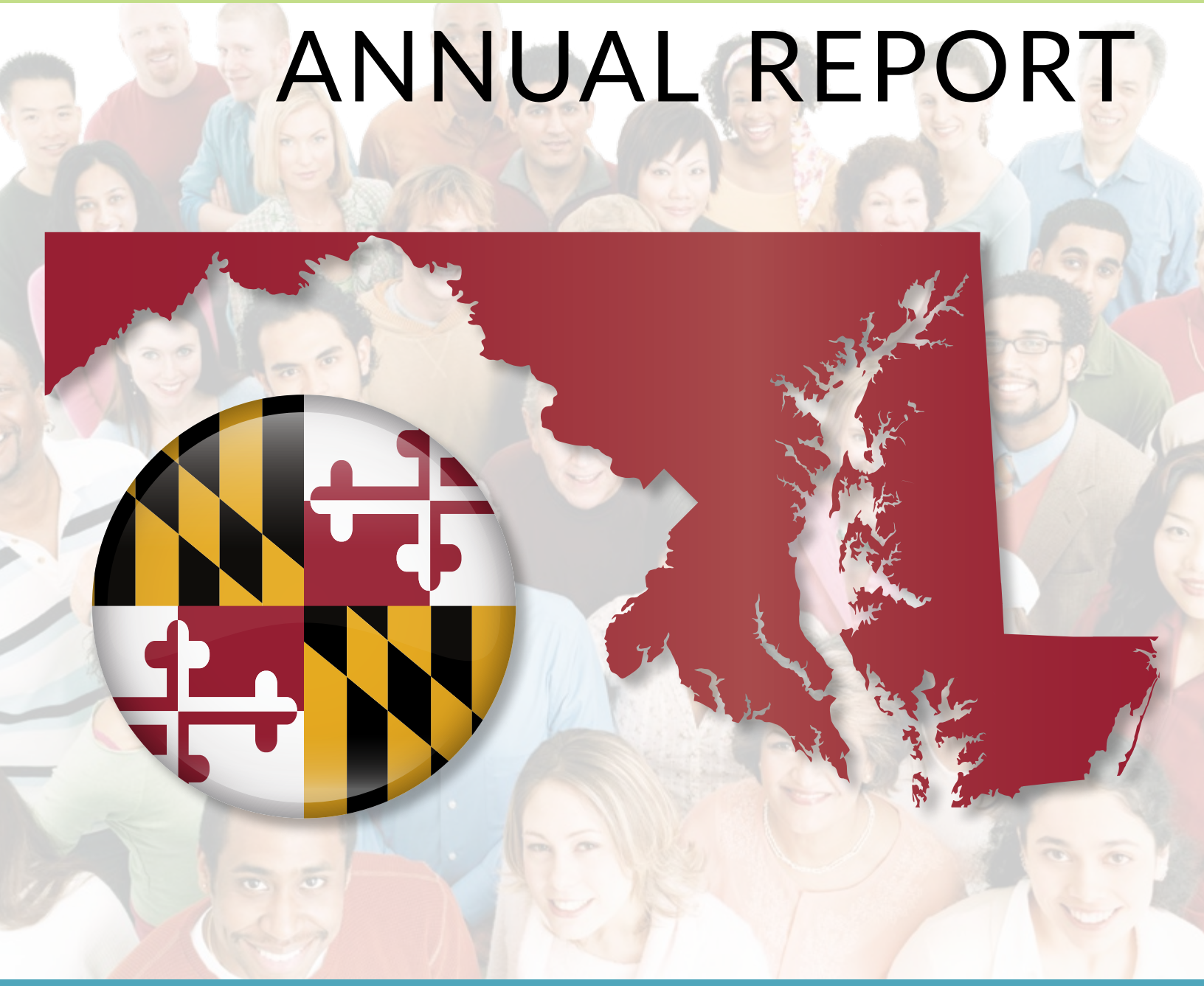
Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

2016

ANNUAL REPORT



www.mdpoison.com

1.800.222.1222

From the Director

The one constant in life is change. Health care delivery and payment are changing almost daily. Medicine and pharmacy are changing rapidly as well. One of the areas of medicine and pharmacy changing most acutely and impacting nearly everyone in the U.S. is prescribing practices involving opioids. In March 2017, Governor Larry Hogan declared a state of emergency in Maryland in response to the opioid epidemic. In his comments, Governor Hogan called for an "all hands on deck" approach to dealing with the problem of opioid addiction and overdoses.

For nearly 45 years, the Maryland Poison Center (MPC) has met the challenges that come with change. And we stand ready to address what surely will be changes in the coming years. For example, the MPC's response to the opioid epidemic started several years ago, through our partnership with the Maryland Department of Health and Mental Hygiene (DHMH) to understand the scope of the problem and provide information to state and local health departments to help them respond. We've also been working with DHMH on bystander naloxone training and are one of the agencies to call after administration of naloxone. In 2016, the MPC received 448 calls regarding bystander naloxone administration with 79 percent of patients being transported to a health care facility. The MPC monitored and participated in the care of 76 percent of these patients. Compared to 2015, we saw a 73 percent increase in bystander naloxone calls, underscoring the important role the MPC plays in dealing with the opioid epidemic.

As a result of the incredible increases in opioid-related overdoses and deaths, we've altered the standardized poison center reporting process to help capture more specific and detailed information on these patients. Reports on these experiences are now being sent to most local health departments on a weekly basis. State and local health departments would not see this detailed information on specific bystander naloxone administrations if not for the MPC.

Despite our 300 years of collective experience, the Maryland Poison Center is also experiencing change among our staff, with the retirement of two long time MPC staff members at the end of September. Randy Goldberg, a poison specialist, has been with the MPC for 21 years. Lisa Booze, a poison specialist, health professional educator, outlier responder, and Twitter maven, started at the MPC 38 years ago. We will miss them both as they head off to enjoy the next phases of their lives!

These retirements provide an opportunity to welcome new staff to the MPC and for the cycle to begin again. In 2016, two of our newest poison specialists successfully passed their certification examinations to earn the designation of Certified Specialist in Poison Information. Our most recent hire successfully passed her certification exam just a few weeks ago.

The MPC's infrastructure is changing as well. We are in the process of updating our server environment to ensure our staff is working with the most up-to-date technology and that we receive information faster and store it more securely. The updates also allow us to have a shadow system for our telephones and computer network so that should one system fail, the back-up system will prevent any lapse in service.

We've also made changes in the way we communicate about who we are and what we do. While handing out stickers, magnets, and brochures at health fairs has worked in the past, people now want information delivered directly to their electronic devices. And they want the flexibility to view information when it is convenient. In the spring, we hired Whitney Pennington as a communications specialist responsible for the MPC's social media presence. Be sure to follow us on Twitter and Facebook to see her good work and help us spread the word about the Maryland Poison Center. Also new, you can quickly save the MPC phone number in your smart phone by texting "poison" to 797979.

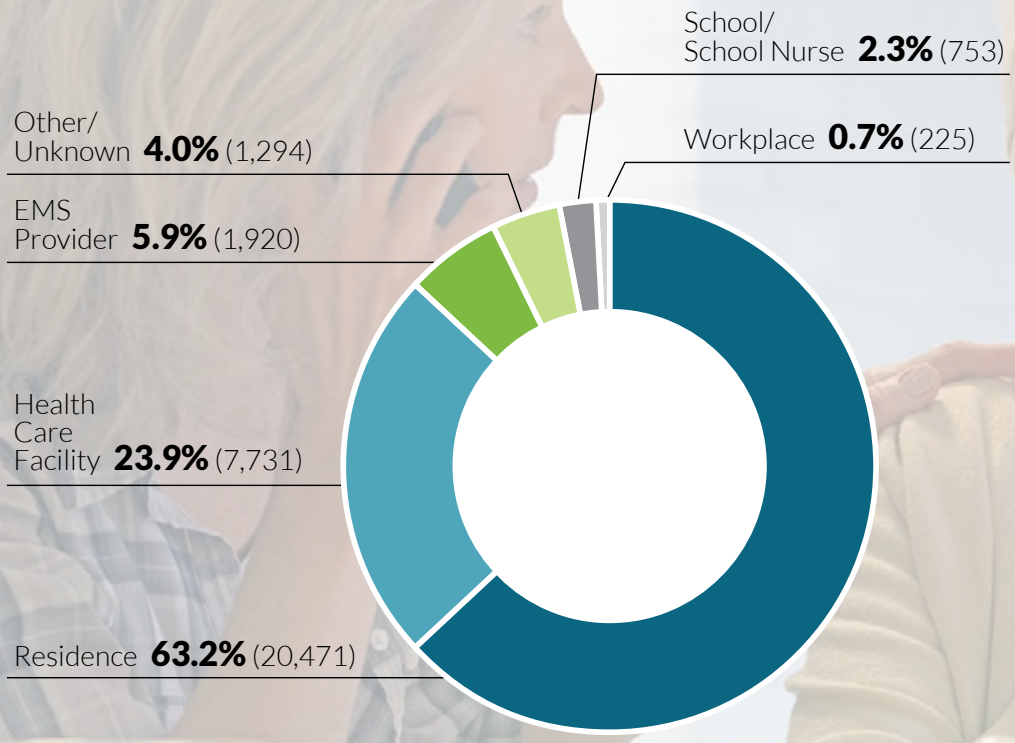
What hasn't changed is our commitment to serve Maryland's citizens and to decrease the cost and complexity of poisoning and overdose care while maintaining and/or improving patient outcomes. Our commitment to that mission is evident throughout this year's annual report. In this report, you will see our strong partnership with first responders and health care providers along with our ability to manage many exposures at home. Plus, you will see our dedication to educating the public and health care providers alike.

Sincerely,

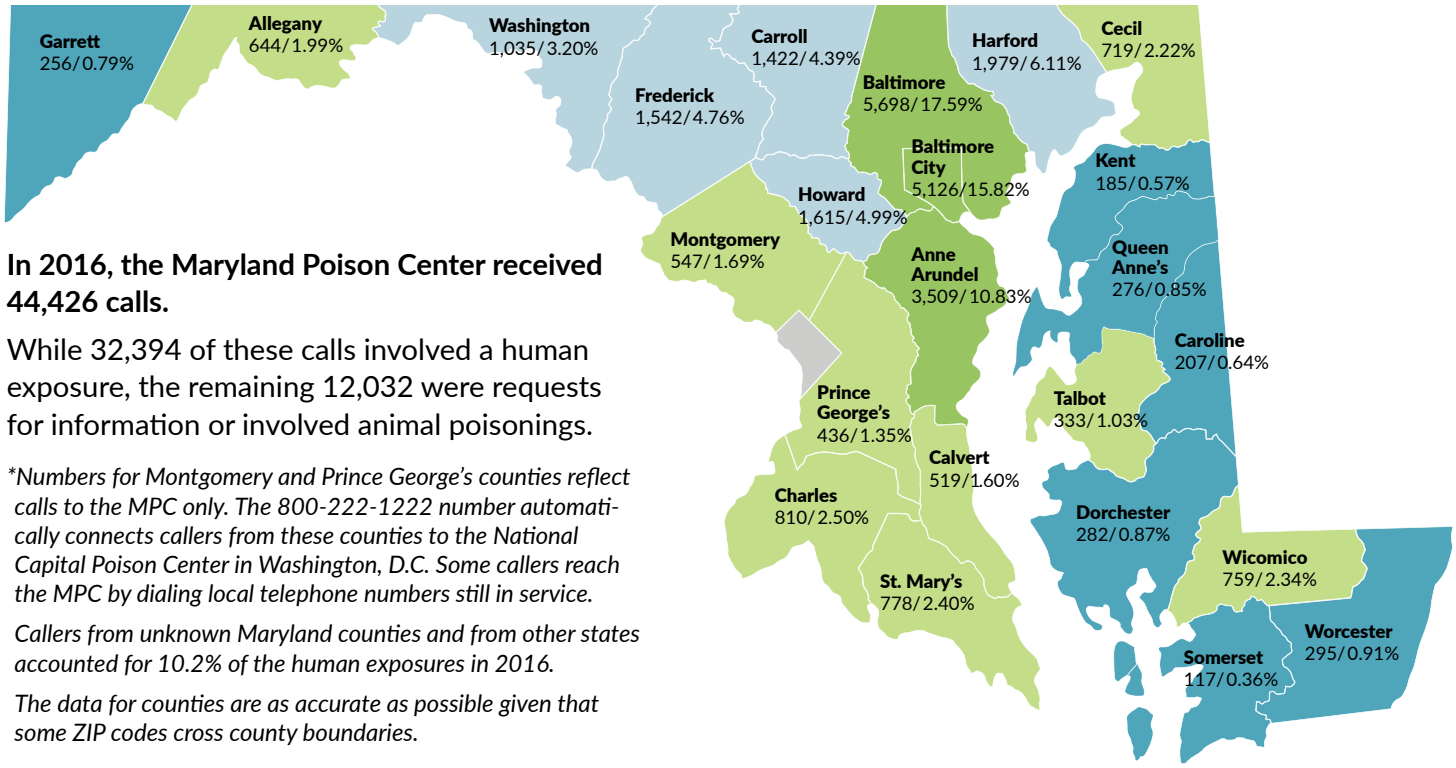
Bruce D. Anderson, PharmD, DABAT, FAACT
Executive Director
Maryland Poison Center
Professor of Pharmacy Practice and Science
University of Maryland School of Pharmacy

Site of Caller

Most of the calls to the MPC came from the patient's residence or another residence (63.2 percent). Some 23.9 percent of the callers were at a health care facility (hospital, doctor's office, clinic, and others). In 5.9 percent of the cases, an emergency medical services provider (EMS, paramedic, first responder, emergency medical dispatcher) called the MPC for treatment information. Calls originating from teachers, students, and nurses in schools accounted for 2.3 percent of the calls in 2016.



Human Exposures*



In 2016, the Maryland Poison Center received 44,426 calls.

While 32,394 of these calls involved a human exposure, the remaining 12,032 were requests for information or involved animal poisonings.

**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 2016.

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

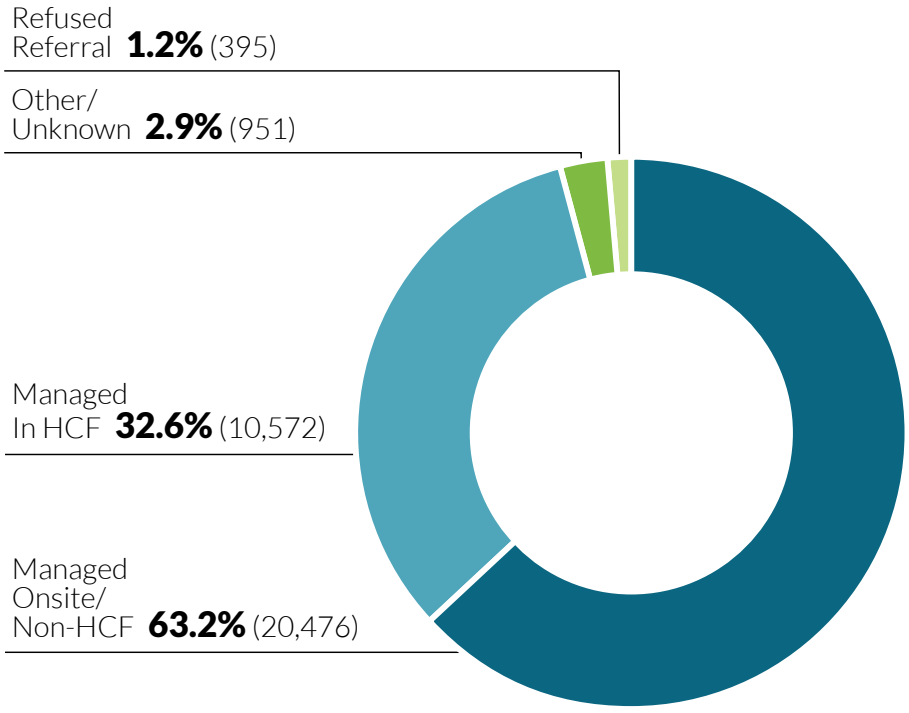
Exposures by Age

44,426

Total Calls Answered BY THE **Maryland Poison Center in 2016**

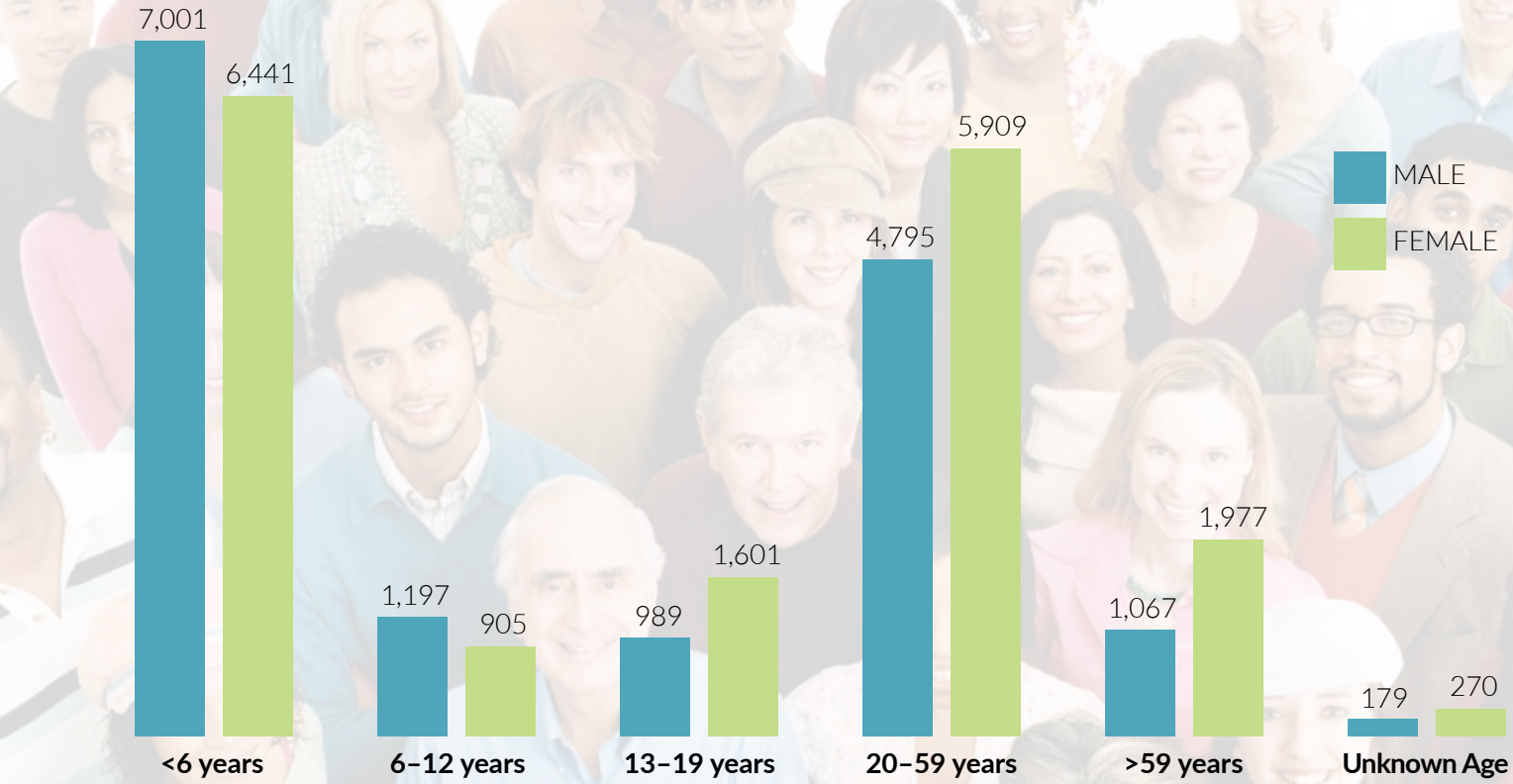
MPC Safely Manages Patients at Home

In 2016, 63.2 percent of all poisoning cases were safely managed at home (site of exposure), which saves millions of dollars in unnecessary health care costs compared with managing patients in a health care facility (HCF). It also allows more efficient and effective use of limited health care resources. In fact, when EMS providers or 911 consult with the MPC about patients, 14 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. Calling the MPC helps to save lives and save dollars!



Gender

47 percent of exposures occurred in males and 52.8 percent in females (0.2 percent unknown).



Animal Exposures

In 2016, a total of 1,185 potentially toxic exposures in animals were reported.

Call Types

Public and Professional Education

Outreach, education, and research are key elements of the MPC's services.

The MPC led 129 education programs and events for public and health professional groups, attended by more than 16,500 people.

Educational materials were distributed throughout Maryland at programs and health fairs, and by community organizations.

The Maryland Poison Center (MPC) is well known for being an emergency telephone service that helps those who have been poisoned, including unintentional poisonings in small children, exposures to household products, occupational exposures, and intentional overdoses. But did you know that the MPC also educates thousands of people each year about poisonings and overdoses?

Our public education efforts are intended to help increase the awareness of the poisons that are found in every home, business, and school, and to help prevent poisonings from occurring. The MPC also strives to make sure that everyone knows that they can quickly and easily get information by contacting the Maryland Poison Center, 24/7, if a poisoning occurs.

In 2016, the MPC attended 87 programs in 12 Maryland counties, Baltimore City, and Alexandria, Virginia. These programs and events reached approximately 5,500 people. In addition, the MPC provided educational materials for 37 additional programs in eight counties and Baltimore City. Several organizations partnered with the MPC to provide education to their patients, customers, clients, and students. These organizations included fire departments, police departments, hospitals, health departments, pharmacies, hospital perinatal education programs, CPR instructors, parish nurses, the American Red Cross, and Head Start and Healthy Start programs. In all, approximately 29,000 pieces of educational materials (brochures, magnets, telephone stickers, Mr. Yuk stickers, teacher's kits, and other pieces) were distributed at these programs and by these organizations. Approximately 90,000 additional materials were mailed to people and groups who requested them.

Fourteen county school systems and daycare centers used educational materials from the MPC in their classrooms. All told, approximately 40,000 pieces of educational material were used in or handed out in schools throughout Maryland.

National Poison Prevention Week (March 20-26, 2016) activities included mailings to emergency departments throughout the state. The MPC partnered with Safe Kids Baltimore, Safe Kids Carroll County, Safe Kids Frederick County, Safe Kids Washington County, the Wicomico County Health Department, St. Mary's County Public School nurses and Cecil County Department of Emergency Services to offer Poison Prevention Week kits to elementary schools in their areas. Schools could choose from a list of activities to increase awareness of poison safety to the students and their families. In all, 48 schools participated, reaching more than 19,400 students. Finally, daily Facebook posts were made providing poison safety tips.

Professional education is targeted towards the special needs of health professionals. Programs

The MPC educates thousands of people each year about poisonings and overdoses.

and materials are designed to help clinicians better manage poisoning and overdose cases that end up in a health care facility. In 2016, the MPC staff conducted 42 programs at hospitals, fire departments, colleges, professional conferences (state, regional, and national) and on the Internet as webinars. These programs were attended by more than 11,000 physicians, nurses, EMS providers, pharmacists, physician assistants, and others. Podcasts were recorded for broadcast on two websites devoted to continuing education for health care providers: MedicCast.com and NursingShow.com.

The Maryland Poison Center also provides on-site training for physicians, pharmacists, and EMS providers. Dozens of health professionals came to the MPC in 2016 to learn about the assessment and treatment of poisoned patients.

Communications and Social Media

In 2016, the Maryland Poison Center (MPC) and/or staff were featured prominently in the media twice, both in markets outside of Baltimore. In March, during National Poison Prevention Week, the *Carroll County Times* highlighted local MPC statistics and provided poison safety tips. In September, the *Calvert Reporter* interviewed center director Bruce Anderson, PharmD, about a copperhead snakebite in a young child.

The MPC's Facebook page shares content with the general public on topics related to poison prevention and safety. In 2016, staff created 76 posts, which led to content being viewed more than 46,000 times. At least 6,247 unique users viewed the content. Throughout the year, the page had a net increase of 66 followers, a 10 percent increase, totaling 731 followers. These followers indicate that they live in cities around the world, with 12 Maryland counties and Baltimore City represented.

In 2016, the Maryland Poison Center's Twitter account for healthcare professionals, @MPCToxTidbits, posted clinical and medical toxicology content relevant for health care providers. This account tweeted 272 times, garnering more than 110,000 impressions and 2,600 engagements.

In 2016, there were nearly 60,000 page views on mdpoison.com from 20,454 users. Users got to mdpoison.com most frequently via a Google search. The most frequently visited pages on the site, after the home page, were the Activity Sheets page followed by the ToxTidbits page for health care providers.

25%

OF

@MPCToxTidbits Twitter Followers are International

Visitors to the ToxTidbits page

ON THE

Maryland Poison Center Website were from the US & 54 other Countries

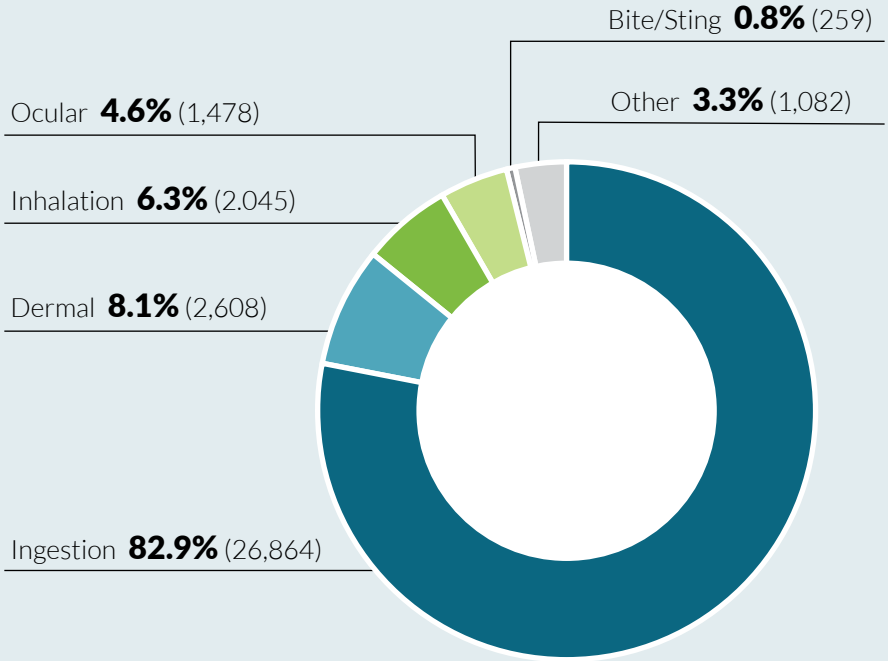
For Every Dollar Spent

ON

Poison Center Services,

$13 is saved in health care costs.

Route of Exposure*



The most common way that patients in Maryland were exposed to toxins was by ingestion. This includes cases of children putting substances in their mouths, patients mistakenly ingesting someone else's medicine, people accidentally brushing their teeth with a product intended for topical use, etc. The dermal route was the next most common means of exposure.

**Some cases involved multiple routes of exposure. Percentages in the chart are based on the total number of human exposures. (relates to total from table)*

ToxTidbits and Poison Prevention Press

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. Some topics presented in 2016 include "Button Batteries," "Child-resistant Containers," "Insect Repellents," "Eye Exposures," "Keeping Toddlers Safe from Grandma's Medicines," and a "Holiday Poem." *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 2016 include "Carbon Monoxide Myths," "Synthetic Opioids," "Physostigmine," "Lionfish Stings", "Carfentanil" and "Bystander Naloxone and the Poison Center." *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 our website (www.mdpoison.com) and click on "Receive Newsletter." Current and previous issues of both newsletters can be read and downloaded from the MPC website as well.

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


ToxTidbits
Maryland Poison Center
May 2017
Poison Center Hotline: 1-800-222-1222
The Maryland Poison Center's Monthly Update: News, Advances, Information
Bupropion Abuse
Bupropion is a unique monocyclic antidepressant and smoking cessation agent that is used off-label for anxiety, bipolar disorder, and attention deficit hyperactivity disorder. It blocks dopamine and norepinephrine reuptake. Bupropion is structurally similar to stimulants such as amphetamine but is generally recognized as possessing low abuse potential. Studies conducted decades ago found that bupropion did not have reinforcing effects or produce amphetamine-like euphoria at therapeutic doses. As such, bupropion has been considered a safe antidepressant in patients with stimulant abuse disorder.
Interestingly, there are case reports of bupropion use to achieve nonmedical psychoactive effects. Patients with pre-existing psychiatric disorders or substance use disorders may be more likely to abuse bupropion. Of 17 published cases, eight involved crushing tablets and snorting them (insufflation), three cases were of parenteral use, one case of both insufflation and parenteral administration and five cases of ingesting supratherapeutic doses. In addition, 67 cases were identified in an 11-year review of bupropion insufflation exposures in adults reported to the California Poison Control System (*Clin Toxicol 2014;52:969-72*).
Outside of case reports and the California study, information on bupropion abuse is limited. To learn more about bupropion abuse, researchers at the Maryland Poison Center performed a study of bupropion exposures in the U.S. coded as intentional abuse using national poison center data over a 14-year period (*J Addict Med 2016;10:357-62*). Exposures in persons aged 13 years and older involving bupropion as the only substance and followed to a known medical outcome were included. There were 975 bupropion abuse cases in the study, of which 66.2% were male. Teens and young adults in their 20s accounted for two-thirds of cases. There was a three-fold increase in abuse cases between 2000 and 2012, with a small drop in 2013. New England states had the highest per-capita rates. The route was ingestion in three-fourths of cases; other routes included insufflation in 17%, parenteral in 1.7% and other/unknown in 1.7%. In 30 additional cases, more than one route was involved, mainly ingestion and insufflation. Most frequent clinical effects were tachycardia, seizures, agitation/irritable, hallucinations/delusions and tremors. While one-third of patients experienced seizures, a relationship between route and frequency of seizures was not observed. Close to half of patients required admission for medical care, while just over one-third were treated and released from the emergency department. Approximately 60% of patients experienced serious toxicity (moderate or major effects) and there were four deaths. Since this study excluded cases involving other substances, the actual number of cases of abuse is likely higher and it is unclear how often bupropion is abused with other drugs.
Abuse of bupropion has potentially serious consequences. For some patients in whom bupropion therapy is being considered, risk of abuse should be weighed against bupropion's benefits.
Wendy Klein-Schwartz, Pharm.D., MPH, FAACT
Professor Emeritus
University of Maryland School of Pharmacy
Subscribe to ToxTidbits and read past issues at www.mdpoison
Poison Center Hotline
1-800-222-1222
PoisonPreventionPress
Bites and Stings
Did you know that...
Follow the MPC on Facebook & Twitter
Courtesy of CDC
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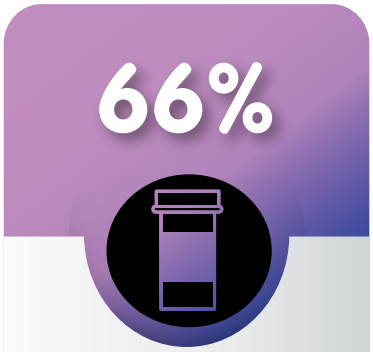
OF

Maryland Poison Center Facebook Followers are Female



Calls Involving Seniors were about Medicines

FROM

Schools

OR

School Nurses

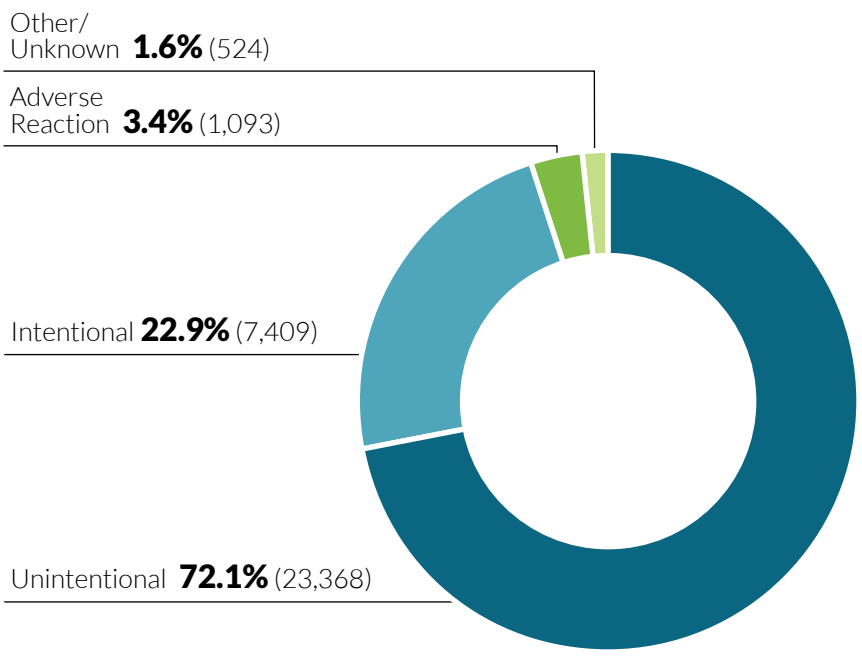
TOP 5 CAUSES OF POISONING

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

Circumstance

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

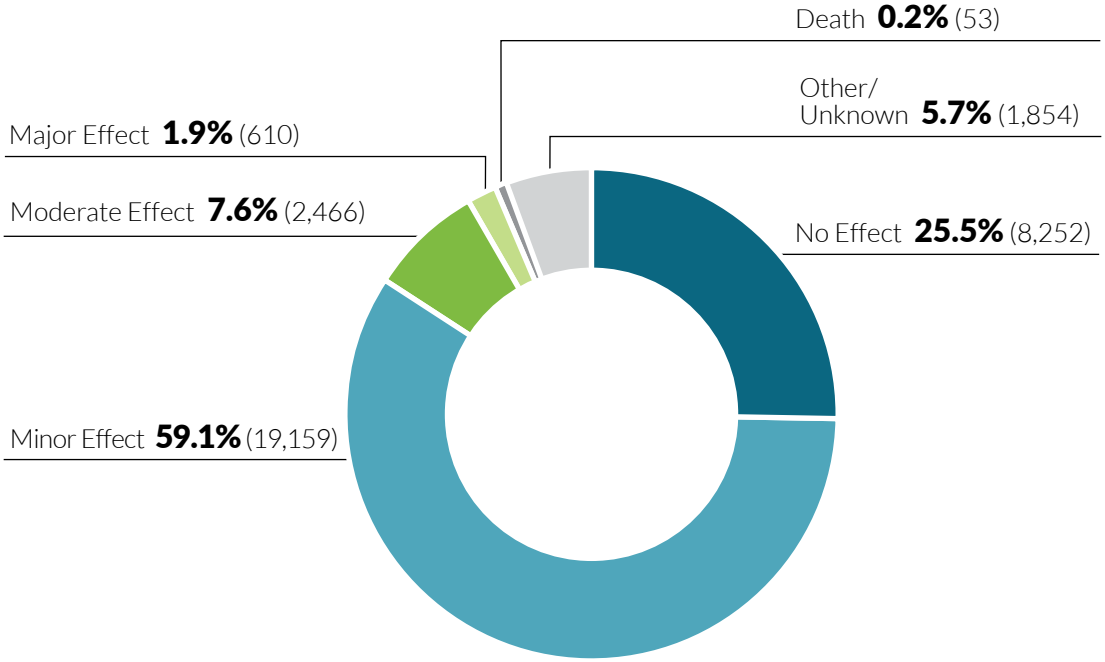
- Unintentional exposures in children and adults, occupational or environmental exposures, bites/stings, therapeutic errors and misuse of products, and food poisoning accounted for 72.1 percent of total exposures. Therapeutic errors (double-doses, wrong medicines taken, etc) alone accounted for 15 percent of total exposures.
- Intentional exposures, due to misuse, abuse, or suicide attempts, accounted for 22.9 percent of total exposures.
- Adverse reaction to drugs, food, and other substances accounted for 3.4 percent of total exposures.
- Other/unknown reasons, including malicious or contaminant/tampering, accounted for 1.6 percent of total exposures.



Medical Outcomes

The true measure of the effectiveness of the MPC program is in patient outcomes. Although there were 53 cases reported to the MPC that resulted in death (0.2 percent) in 2016, the impact of the MPC is obvious: most cases had good outcomes. Some 84.6 percent of cases resulted in (or were expected to result in) no effects or minor effects. For all exposures, prompt attention 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 on the right list the most common substances involved in poisonings and overdoses reported to the Maryland Poison Center in 2016. Some 79 percent of the poisoning and overdose calls to the Maryland Poison Center involved a drug, while 48.5 percent of calls involved a non-drug substance. A patient may be exposed to more than one substance in a poisoning or overdose case. Percentages in the tables are based on the total number of human exposures.

TOP 10 DRUG SUBSTANCES

	No.	%
Analgesics	5,110	**15.8%**
Sedatives/Hypnotics/ Antispychotics	3,003	**9.3%**
Antidepressants	2,094	**6.5%**
Cardiovascular Drugs	1,941	**6.0%**
Antihistamines	1,742	**5.4%**
Stimulants/Street Drugs	1,694	**5.2%**
Anticonvulsants	1,166	**3.6%**
Hormones (including diabetes and thyroid medicines)	909	**2.8%**
Antimicrobials	905	**2.8%**
Vitamins	902	**2.8%**
Others	6,135	**18.9%**
TOTAL	25,601	**79.0%**
TOTAL HUMAN EXPOSURES	32,394	

TOP 10 NON-DRUG SUBSTANCES

	No.	%
Cosmetics/ Personal Care Products	2,983	**9.2%**
Cleaning Substances (Household)	2,730	**8.4%**
Alcohols	1,443	**4.5%**
Foreign Bodies/ Toys/Miscellaneous	1,341	**4.1%**
Pesticides	1,094	**3.4%**
Plants	599	**1.8%**
Arts/Crafts/Office Supplies	544	**1.7%**
Chemicals	493	**1.5%**
Fumes/Gases/Vapors	462	**1.4%**
Hydrocarbons	439	**1.4%**
Others	3,591	**11.1%**
TOTAL	15,719	**48.5%**
TOTAL HUMAN EXPOSURES	32,394	

Research Presentations and Publications

Bivens A, Klein-Schwartz W, Whittaker C, Tom S. Test your medicine IQ - A comparison of educational outreach methods in older adults. North American Congress of Clinical Toxicology, Boston. Poster. September 2016.

Klein-Schwartz W, Stassinos G, Gonzales L, Anderson B. Comparison of Atypical Antipsychotic Exposures in Young Children Reported to U.S. Poison Centers. 36th Congress of the European Association of Poisons Centres and Clinical Toxicologists. Madrid, Spain. Poster. May 24-27, 2016.

Doyon S, Benton C, **Anderson B,** Baier M, Haas E, Hadley L, Maehr J, Rebbert-Franklin K, Olsen Y, Welsh C. Incorporation of poison center services in a state-wide overdose education and naloxone distribution program. Am J Addictions 2016;25(4):301-6.

Wilkerson R, **Kim H,** Windsor T, Mareiniss D. The opioid epidemic in the United States. Emerg Med Clin North Am. 2016;34(2):e1-e23.

Kim H, Nelson L. Reversal of opioid-induced ventilatory depression using low-dose naloxone (0.04 mg): a case series. J Med Toxicol 2016;12(1):107-10.

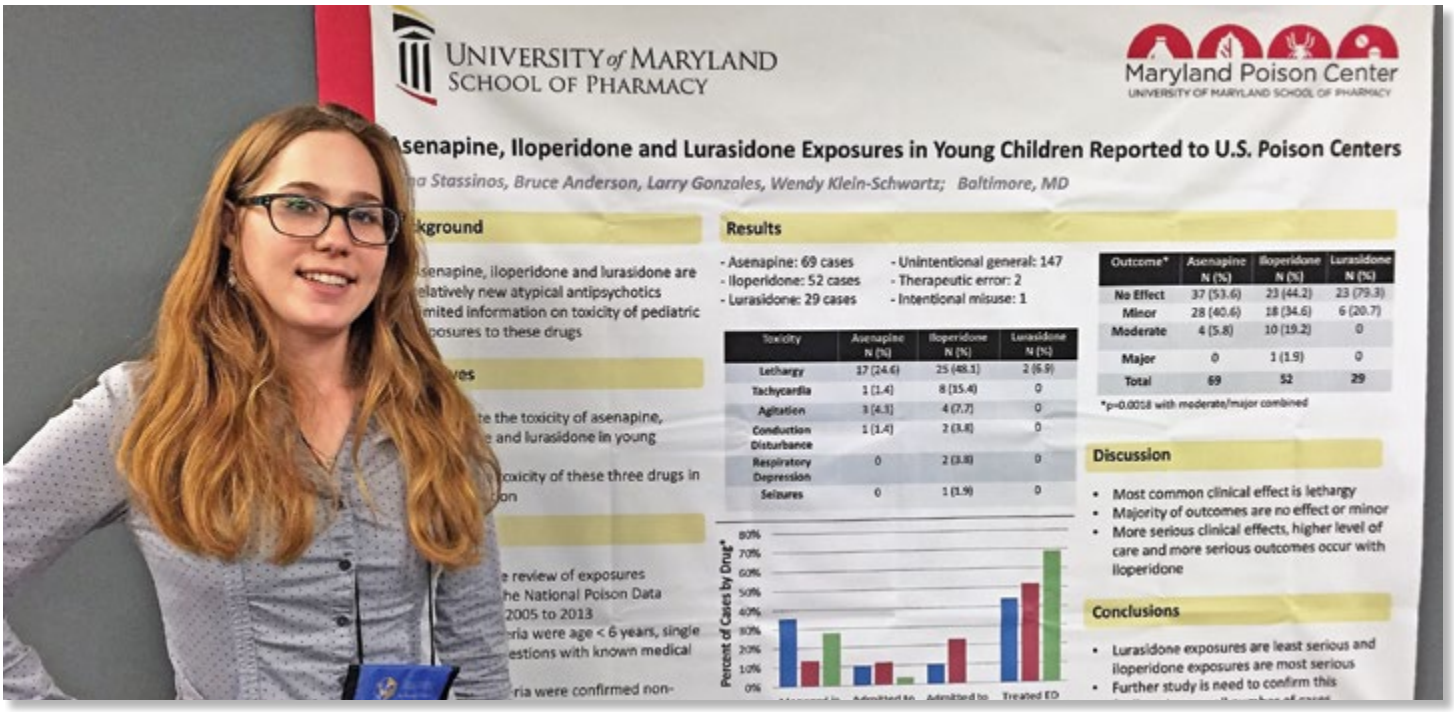
Spiller H, Mowry J, Aleguas A, Griffith J, Ryan M, Bangh S, **Klein-Schwartz W,** Schaeffer S, Casavant M. An observational study of the Factor Xa inhibitors rivaroxaban and apixaban as reported to eight poison centers. Annals of Emergency Medicine 2016;67:189-195.

Klein-Schwartz W, Stassinos G, Isbister G. Treatment of sulfonylurea and insulin overdose. British Journal of Clinical Pharmacology 2016;81(3):496-504.

Azab S, Hirshon J, Hayes B, El Setouhy M, Smith G, Sakr M, Tawfik H, **Klein-Schwartz W.** Epidemiology of acute poisoning in children presenting to the poison control center at Ain Shams University in Cairo, 2009-2013. Clinical Toxicology 2016; 54(1):20-26.

Stassinos G, Klein-Schwartz W. Bupropion "abuse" reported to U.S. poison centers. Journal of Addiction Medicine 2016;10(5):357-62.

Stassinos G, Klein-Schwartz W. Comparison of pediatric atypical antipsychotic exposures reported to U.S. poison centers. Clinical Toxicology 2016 Sept 20, [E-pub ahead of print],



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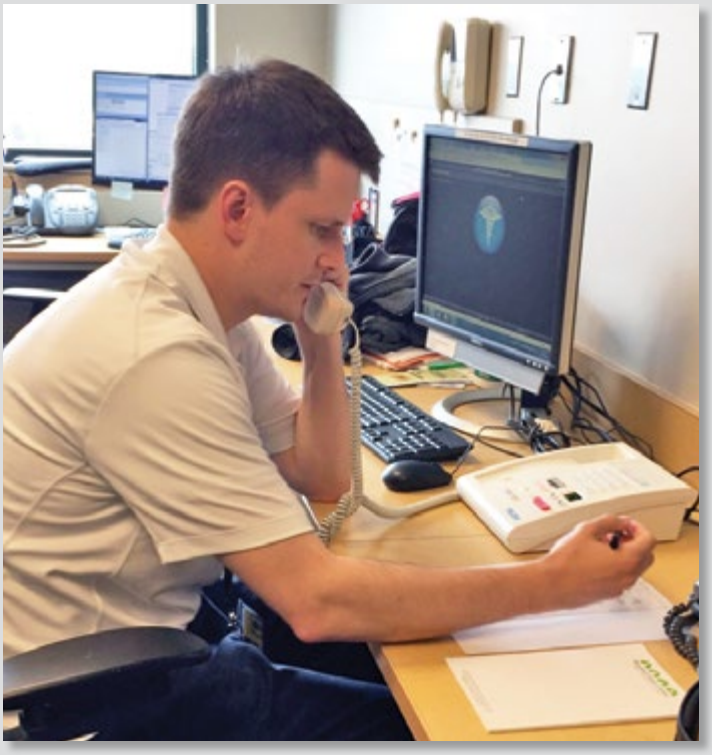

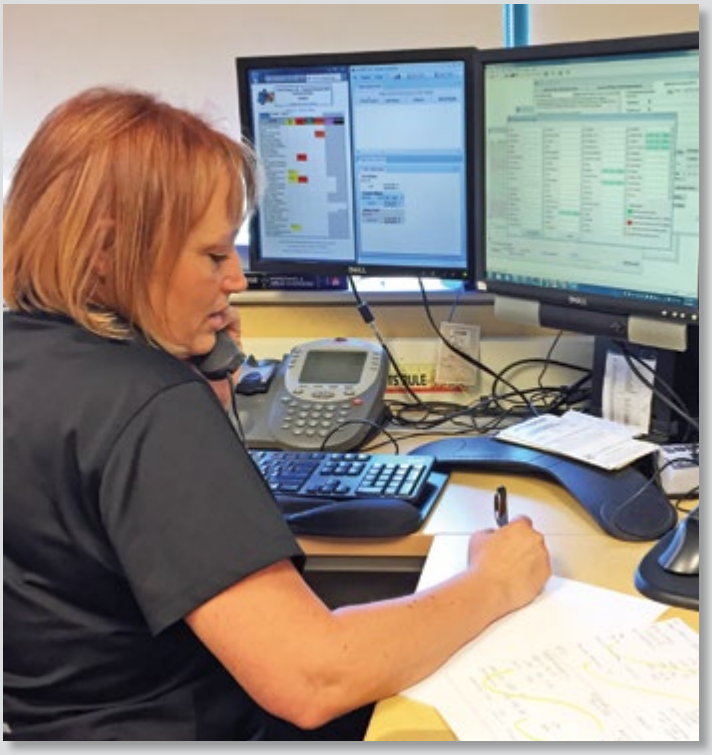

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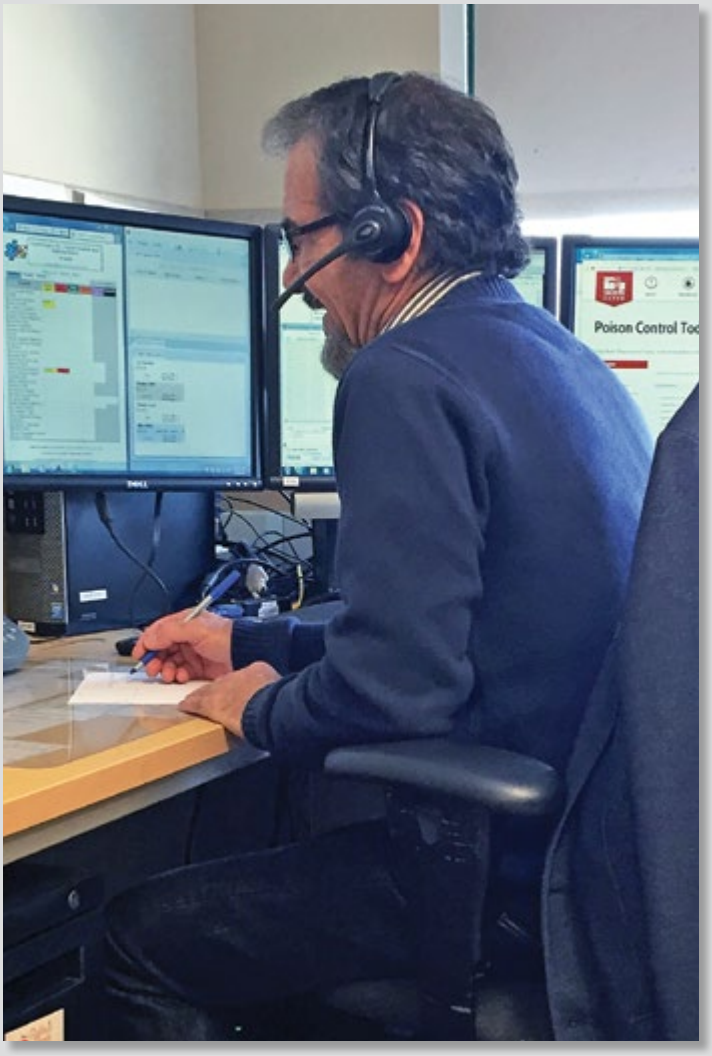
- Maryland Institute for Emergency Medical Services Systems (MIEMSS)
- Priority Partners MCO
- Safe Kids Maryland State and Local Coalitions
- PharmCon, Inc.



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or visit
www.mdpoison.com
to see how you can support the Maryland Poison Center.

Maryland Poison Center

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