



Maryland Poison Center  
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

2015

# ANNUAL REPORT

[www.mdpoison.com](http://www.mdpoison.com)



1-800-222-1222

# From the Director

As I'm sitting down to write this message, I'm reminded that Alanis Morissette had a hit song in the mid 1990s called "Ironic." One of life's ironies is that one of the most consistent things in life is inconsistency! Change happens. It may not happen as regularly at the Maryland Poison Center (MPC), but it eventually happens.

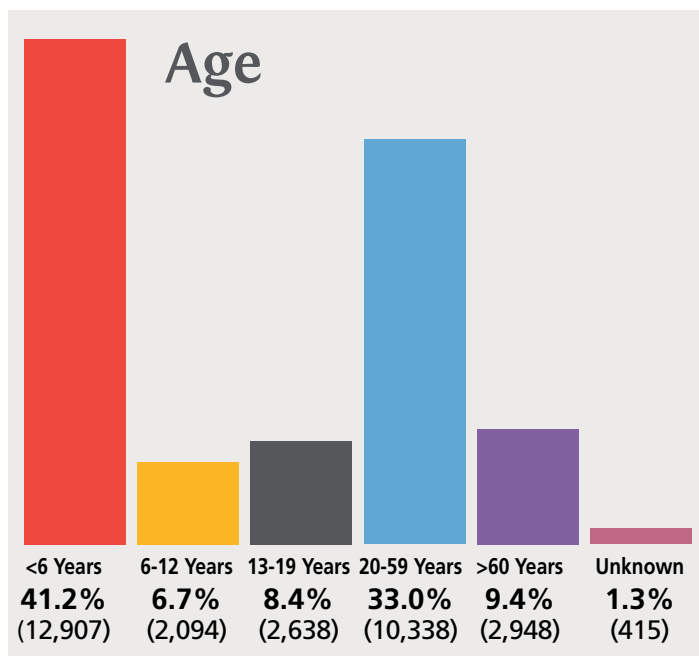


Ten years ago, more than 50 percent of calls to the MPC were about children under the age of six years old. Today, that figure is only 41 percent. Ten years ago, approximately 80 percent of calls were about unintentional situations and 15 percent were intentional. Today, those figures are 72 percent and 22 percent, respectively. Ten years ago, synthetic cannabinoids (also known as "synthetic marijuana") were not commonly being abused, and bystander naloxone did not exist. In 2015, the MPC saw more than a two-fold increase in synthetic cannabinoid calls compared to 2011 along with more severe medical outcomes. The MPC is also very involved in monitoring the use of naloxone by the lay public and law enforcement officers in an effort to decrease opioid overdose deaths. Collecting information on cases assists the Maryland Department of Health and Mental Hygiene assess the success of the naloxone program.

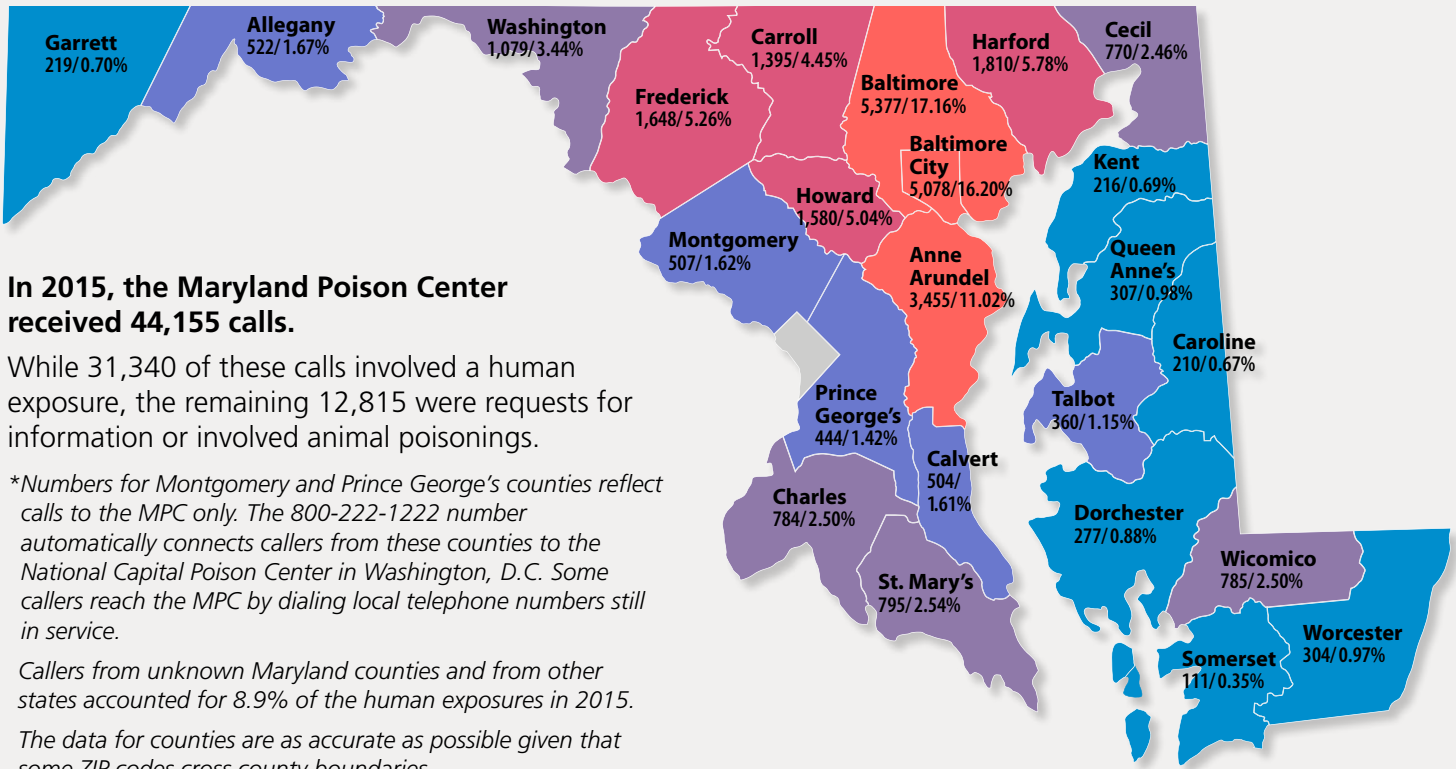
The advancements we have seen at the MPC and the contributions that we make to society, as evidenced by the data in this year's annual report, are in large part due to our staff. But staff change just like our data. We are now preparing for the retirement of Wendy Klein-Schwartz, PharmD, the MPC's coordinator of research and education. After nearly 40 years at the MPC and as a faculty member at the

University of Maryland School of Pharmacy, Dr. Klein-Schwartz will be retiring at the end of June. She has been one of the constants at the School of Pharmacy and the MPC. During her career, she has published more than 100 scholarly articles, participated in dozens and dozens of research projects, taught thousands of different clinicians, from pharmacy students, residents and fellows to physician residents and fellows, paramedic students, nursing students, and many others. She's been responsible for mentoring and training a dozen post-PharmD fellows. Those fellows have gone on to lead poison centers across the country, work in the pharmaceutical industry, take on new roles in emergency departments and in academia, as well as serve in the military. She helped to develop the certification examination that is used to certify poison specialists. She co-wrote the American Association of Poison Control Centers' (AAPCC) annual report for 11 years. Dr. Klein-Schwartz has collaborated with researchers and practitioners from around the country and around the world. She has served in multiple leadership roles within the AAPCC. She truly has had a major impact on the world of clinical toxicology. She has also been instrumental in the development of the Maryland Poison Center. It is clear that the MPC and the world of clinical toxicology have been improved by Dr. Klein-Schwartz's numerous important contributions.

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



# Human Exposures\*



**In 2015, the Maryland Poison Center received 44,155 calls.**

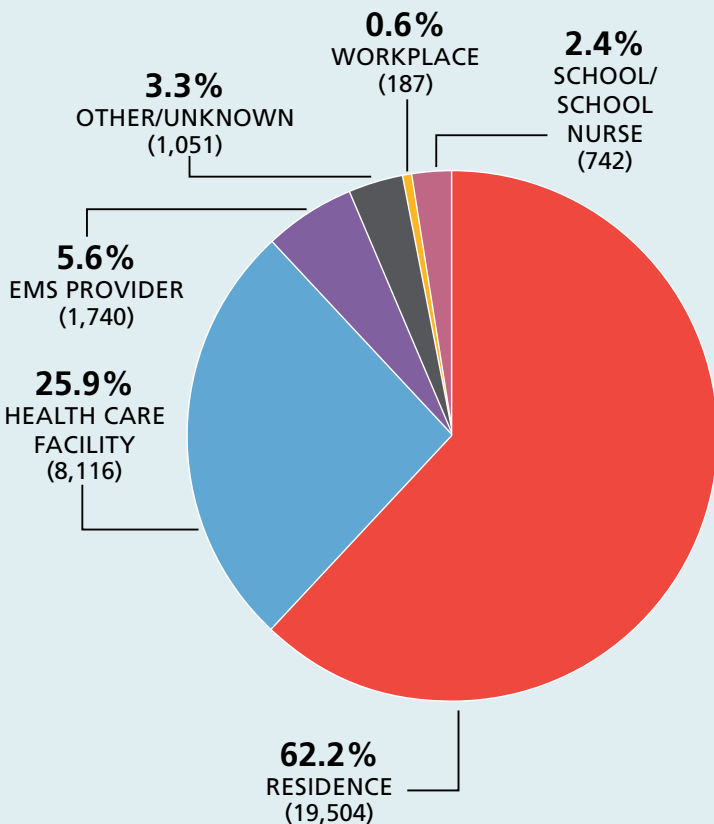
While 31,340 of these calls involved a human exposure, the remaining 12,815 were requests for information or involved animal poisonings.

*\*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 8.9% of the human exposures in 2015.*

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

## Site of Caller



Most of the calls to the MPC came from the patient's residence or another residence (62.2 percent). Some 25.9 percent of the callers were at a health care facility (hospital, doctor's office, clinic, and others). In 5.6 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 2.4 percent of the calls in 2015.



# TOP 5 CAUSES OF POISONING

**1** Pain Relievers



**3** Household Cleaning Products



**2** Sedatives, Hypnotics, and Antipsychotics Medicine



**4** Cosmetics or Personal Care Products

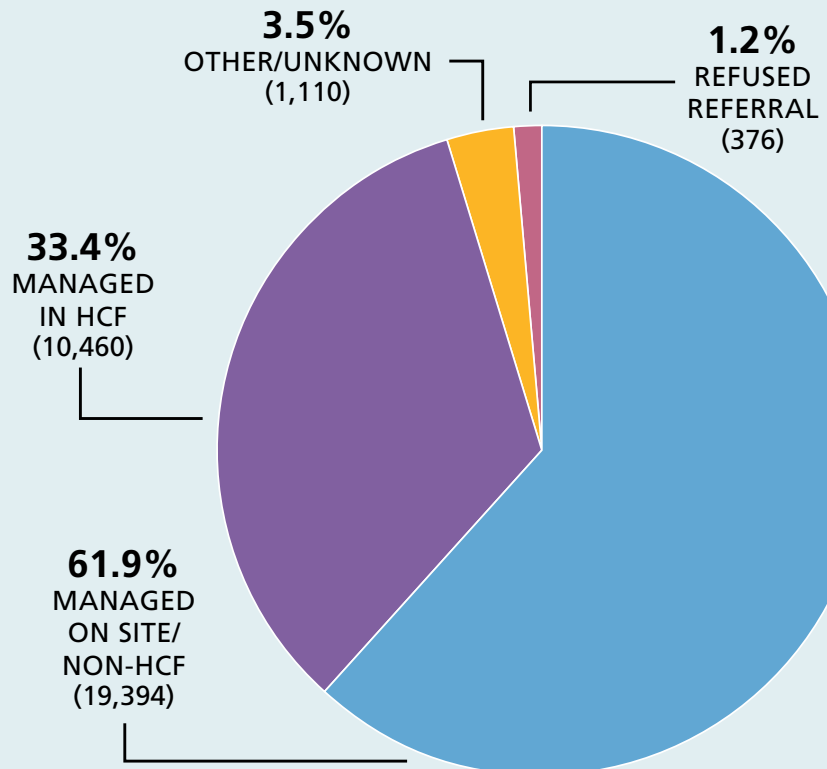


**5** Anti-Depressants



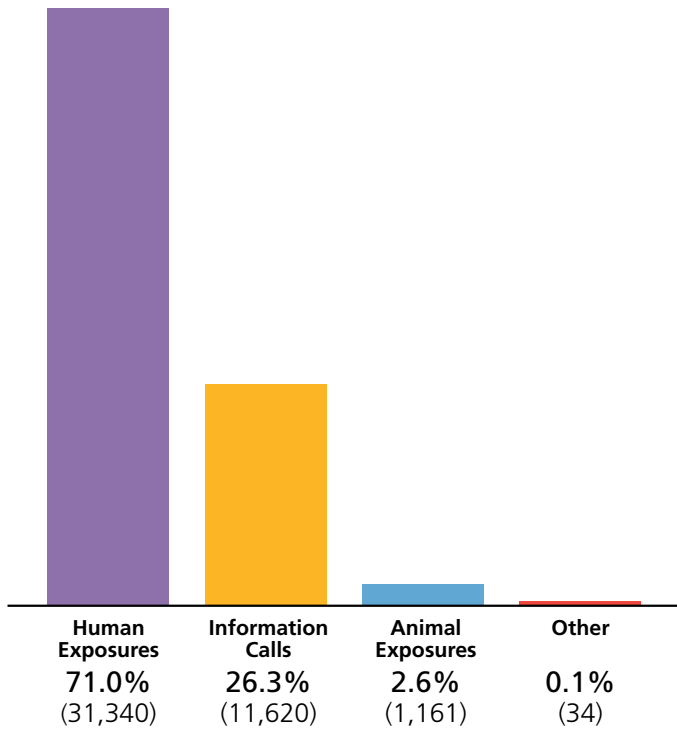
## MPC Safely Manages Patients at Home

In 2015, 61.9 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 for more efficient and effective use of limited health care resources. In fact, when EMS providers or 911 consult with the MPC about patients, 16 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!





## Call Types



## Animal Exposures



In 2015, a total of 1,161 potentially toxic exposures in animals were reported.



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



The MPC led 144 education programs and events for public and health professional groups, attended by more than 20,000 people.

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

## Public and Professional Education 2015

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 2015, the MPC provided speakers and/or materials for 104 programs in 17 Maryland counties, Baltimore City, and Alexandria, Virginia. The programs and events attended by the MPC staff reached approximately 5,200 people. 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 50,000 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 76,000 additional materials were mailed to people and groups who requested them.

Seventeen county school systems and daycare centers used educational materials from the MPC in their classrooms. All told, approximately 30,000 pieces of educational material were used in or handed out in schools throughout Maryland.

National Poison Prevention Week (March 15-21, 2015) activities included mailings to emergency departments throughout the state. The MPC partnered with Safe Kids Baltimore, Safe Kids Carroll County, Safe Kids Washington County, the Wicomico County Health Department, 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, 56 schools participated, reaching more than 19,800 students. Finally, daily Facebook posts were made providing poison safety tips.

The MPC is also an important resource for the media. Poison Center staff members are often interviewed by television, radio, and print media for their expertise in poison-related stories. The MPC is also using Facebook as a means of connecting to the community. Notifications of newsletters, noteworthy toxicology

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



information in the news, and other important tips are shared on a regular basis.

Professional education is targeted towards the special needs of health professionals. Programs and materials are designed to help clinicians better manage poisoning and overdose cases that end up in a health care facility. In 2015, 73 programs were conducted by MPC staff at hospitals, fire departments, colleges, professional conferences (state, regional, and national) and on the Internet as webinars. These programs were

attended by more than 15,000 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](http://MedicCast.com) and [NursingShow.com](http://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 2015 to learn about the assessment and treatment of poisoned patients.

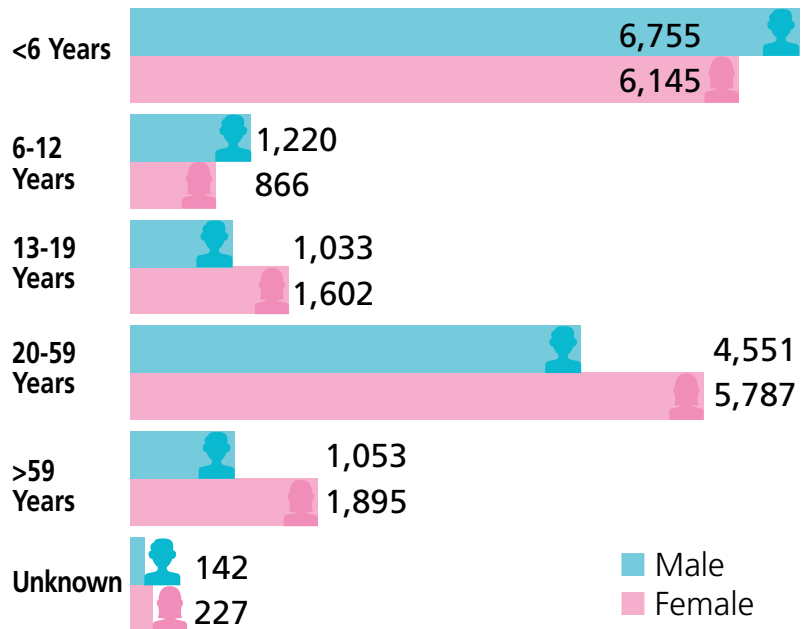






## Gender

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



## 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 2015. Some 78.6 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

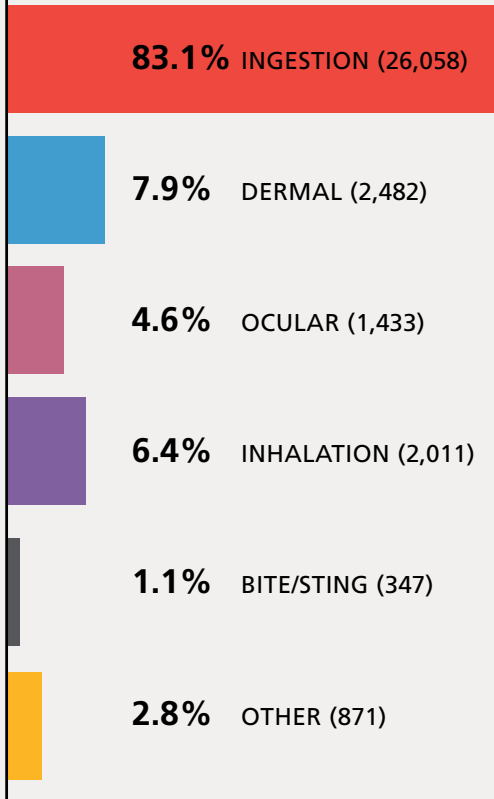
	No.	%
Analgesics.....	4,753	15.2%
Sedatives/Hypnotics/ Antipsychotics.....	2,989	9.5%
Antidepressants .....	2,042	6.5%
Cardiovascular Drugs.....	1,896	6.0%
Antihistamines .....	1,644	5.2%
Stimulants/Street Drugs.....	1,613	5.1%
Anticonvulsants.....	1,201	3.8%
Cold and Cough Medicines.....	925	3.0%
Hormones (including diabetes and thyroid medicines)	914	2.9%
Vitamins .....	899	2.9%
Others .....	5,743	18.3%
<b>TOTAL .....</b>	<b>24,619</b>	<b>78.6%</b>
<b>TOTAL HUMAN EXPOSURES .....</b>	<b>31,340</b>	

### TOP 10 NON-DRUG SUBSTANCES

	No.	%
Cosmetics/ Personal Care Products .....	2,889	9.2%
Cleaning Substances (Household) .....	2,569	8.2%
Alcohols .....	1,382	4.4%
Foreign Bodies/ Toys/Miscellaneous .....	1,298	4.1%
Pesticides.....	1,053	3.4%
Plants.....	666	2.1%
Arts/Crafts/Office Supplies .....	511	1.6%
Chemicals.....	481	1.5%
Hydrocarbons.....	415	1.3%
Bites/Stings.....	413	1.3%
Others .....	3,534	11.3%
<b>TOTAL .....</b>	<b>15,211</b>	<b>48.5%</b>
<b>TOTAL HUMAN EXPOSURES .....</b>	<b>31,340</b>	



# 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)*

**90%**  
of  
**Calls From  
the Public  
Were  
Managed  
at Home**



# Poison Prevention Press and ToxTidbits

The MPC publishes **Poison Prevention Press**, an e-newsletter for the general public. Published every-other-month, the newsletter highlights various poison safety topics for all ages. Some topics presented in 2015 include "Lice Products," "Laundry Packets," "Top Summertime Poison Hazards," "Bystander Naloxone," "Hidden Sources of Alcohol," and "OTC Medicine Safety." **Poison Prevention Press** is sent to e-mail subscribers who are encouraged to post and share the newsletter with others. The MPC also uses Facebook to keep the public up-to-date on poison-related issues, posting tips and notices. In 2015, 59 posts reached more than 200,000 people. By year end, we had approximately 640 "Likes."

**ToxTidbits** is a monthly newsletter for health professionals containing important toxicology information, updates, and news. Some of the topics addressed in 2015 include "Pediatric Marijuana

Ingestions," "Synthetic Cannabinoids," "Drug Induced QT Prolongation," and "Holiday Hazard Myths." **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. The MPC uses Twitter (@MPCToxTidbits) as another tool to keep health professionals up-to-date with toxicology. In 2015, 710 tweets resulted in more than 150,000 impressions. By year end, we had 340 Twitter followers.

To receive **ToxTidbits** or **Poison Prevention Press** by email, visit our website ([www.mdpoison.com](http://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.

**What is a Poison?**  
A poison is any product or substance that can harm someone if it is used:  
• in the wrong way  
• by the wrong person  
• in the wrong amount  
Poisons can be household cleaners, personal care products, medicines, chemicals, pesticides, automotive products, plants and berries, bites and stings, gases and vapors.  
People of all ages can be poisoned. Most poisonings are unintentional. The MPC manages about 64% of calls right at home or where the exposure occurred.  
Be prepared for the unexpected. Program 1-800-222-1222 in your cell phone now, before you need it. Fax, confidential, expert help is a phone call away!

**Did you know that...**  
• In 2014, the MPC managed 386 calls involving single load laundry packets and 88 calls involving liquid laundry detergents.  
• of the 386 calls involving single load laundry packets, 174 were about children under the age of 6 years.

**Single Load Laundry Packets**  
Single load laundry packets were created to make doing laundry easier and less messy. One packet can be used for a load of laundry without having to measure powder or liquid detergent. These laundry packets are very concentrated. The thick covering dissolves in water of any temperature. It can quickly dissolve in a child's mouth. No teeth required. Children can also confuse the packets with candy because of their bright colors. They are fun to play with because they are squishy. But they can easily break when squeezed by a child. This can lead to the liquid squirting on the skin or into the eye or mouth.  
Starting in 2012, U.S. poison centers reported an increase in calls about laundry packets. Most calls involve children aged 5 years and younger. In 2014, there were 11,714 calls about children aged 5 years and younger that got into laundry packets. Already in 2015 there have been about 3,000 exposures to laundry packets.  
The detergent can cause burns in a child's throat and stomach. It can also get in a child's lung, making it hard to breathe. There has been one death caused by laundry packets and many other serious injuries.  
Mild symptoms include:  
• nausea  
• vomiting  
• coughing  
• choking  
• mouth and throat irritation  
• eye redness and burning  
Severe symptoms include:  
• burns in the mouth and throat  
• corneal injury  
• trouble breathing  
• coma  
• death  
Exposure to laundry detergent packets may be associated with severe health effects. Parents and caregivers should keep laundry packets out of reach and out of sight of children. Do not give the packets to young children so they can help with the laundry. Leave the packet in its container until you are ready to put it in the washing machine. Putting it on top of the washing machine or on a table while you are loading the clothes gives young children access to the packet.  
If you suspect someone has swallowed a laundry detergent packet or has gotten the liquid in their eyes, call the poison center right away at 1-800-222-1222. A pharmacist or nurse will guide you on next steps. Time is of the essence. If a person is having trouble breathing, call 911. Do not make your child vomit. This may worsen symptoms as the child may choke and get the contents in their lungs.

Sylvia Okawa-Anash MD, MPH  
Pediatric Emergency Medicine Fellow  
Johns Hopkins Children's Center

Follow the MPC on Facebook!  
Subscribe to **Poison Prevention Press** and read past issues at [www.mdpoison.com](http://www.mdpoison.com)

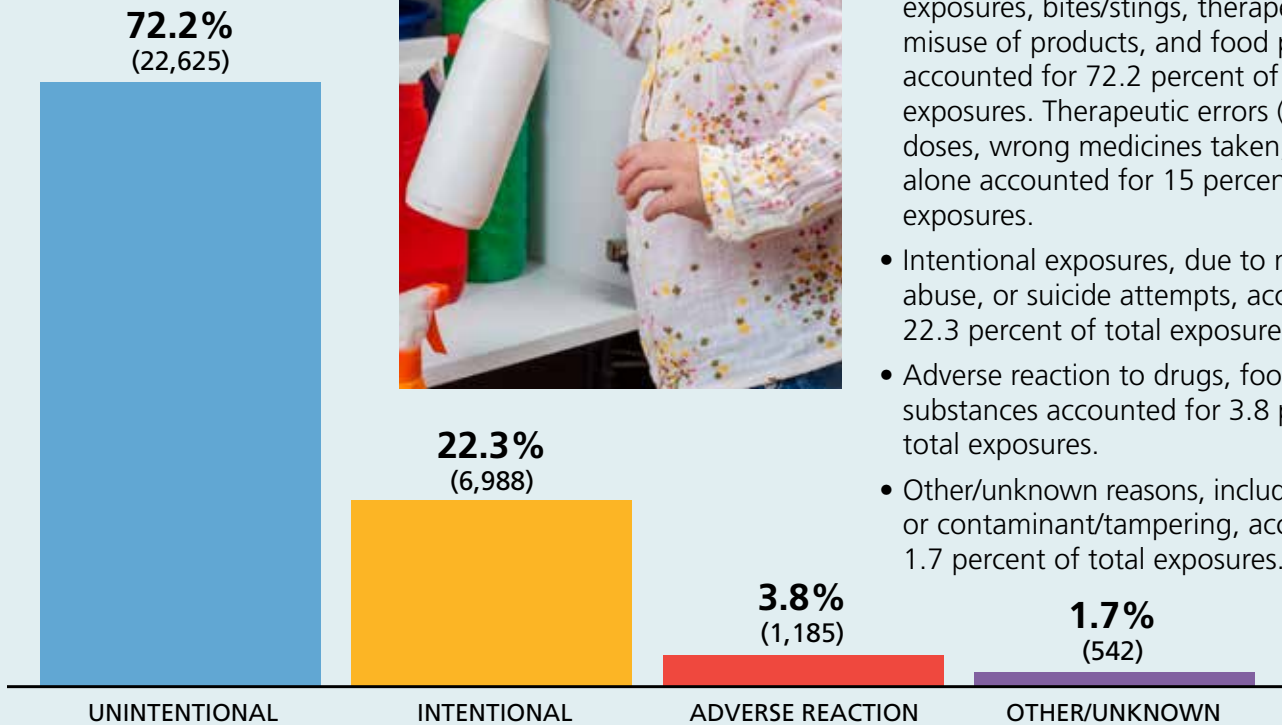
**Synthetic Cannabinoids**  
Spice, K2, Newport, AK 47, Scooby Snax, Bahama Breeze, Bizarro, legal highs... these are a few of the many street names for synthetic cannabinoids, commonly called synthetic marijuana. Scientists and the pharmaceutical industry originally synthesized these compounds for research purposes. By the mid to late 2000s, these chemicals began to be used recreationally. Numerous compounds exist and they continue to change, making it difficult to legislate against them. While some have been made schedule I by the DEA, others are currently legal.  
Synthetic cannabinoids are manufactured in a laboratory with most originating from China and Southeast Asia. The synthesized substances are applied to inert plant matter, often as an uneven mixture of multiple compounds. They can be found in "herb" or "potpourri" in colorful pouches in gas stations, convenience stores, and on the internet. The main route of exposure is inhalation by smoking and there are now liquid forms for use in e-cigarettes.  
The pharmacology of synthetic cannabinoids is not fully characterized. The synthetic cannabinoid compounds that have been studied have nonselective affinity for and agonist action at cannabinoid receptors CB1 and CB2. This is similar to delta-9-tetrahydrocannabinol (THC), the psychoactive cannabinoid in cannabis plants. However, there are important differences. THC is a partial agonist at CB1 whereas synthetic cannabinoids are full agonists. They are also thought to have multiple times the receptor affinity and longer half-lives compared to THC. The CB1 receptor is predominant throughout the CNS and causes the majority of psychoactive effects of synthetic cannabinoids. CB1 receptors are located presynaptically on both glutamatergic and GABAergic synapses, suggesting a role in modulating these neurotransmitters. GABA inhibition may explain some excitatory effects. CB2 receptors predominate peripherally and are thought to have anti-inflammatory, immune modulating, analgesic, and anti-emetic effects.  
The use of synthetic cannabinoids is a growing problem. A 2014 Monitoring the Future survey of middle and high school students ranked it the 3<sup>rd</sup> most prevalent drug used after marijuana and amphetamines. Most users are in their teens and 20's, and over 70% are male. From Jan 1, 2015 through May 27, 2015, the Maryland Poison Center (MPC) received 96 calls about synthetic cannabinoid exposures, passing 2014's total of 90 cases. This surge is similar throughout the nation. In 2015 through May 27th, there were 3548 cases reported to U.S. poison centers, while in all of 2014 there were 3682 cases.  
(Continued on page 2)

**Did you know?**  
All synthetic cannabinoid exposures should be reported to a local poison control center.  
Poison centers are closely monitoring synthetic cannabinoid trends along with public health officials. This collected data is being used to update emergency providers on the latest effects and management recommendations. Reporting synthetic cannabinoid exposures enables officials to characterize the toxicity of these compounds and pass laws against them.

Follow us on Twitter  
@MPCToxTidbits  
Subscribe to **ToxTidbits** and read past issues at [www.mdpoison.com](http://www.mdpoison.com)

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

# Circumstance



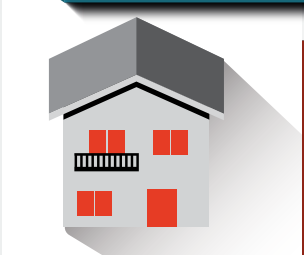
The people who contact the MPC have several different reasons for calling:

- Unintentional exposures in children and adults, occupational or environmental exposures, bites/stings, therapeutic errors, misuse of products, and food poisoning accounted for 72.2 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 22.3 percent of total exposures.
- Adverse reaction to drugs, food, and other substances accounted for 3.8 percent of total exposures.
- Other/unknown reasons, including malicious or contaminant/tampering, accounted for 1.7 percent of total exposures.



## 1,965 Calls Involving Seniors Were about Medicines...

*64% of these calls were medication errors.*



## 16% of Patients Seen By EMS or Who Call 911 Are Not Taken To a Health Care Facility...

Based on poison center advice they can be managed safely at home.



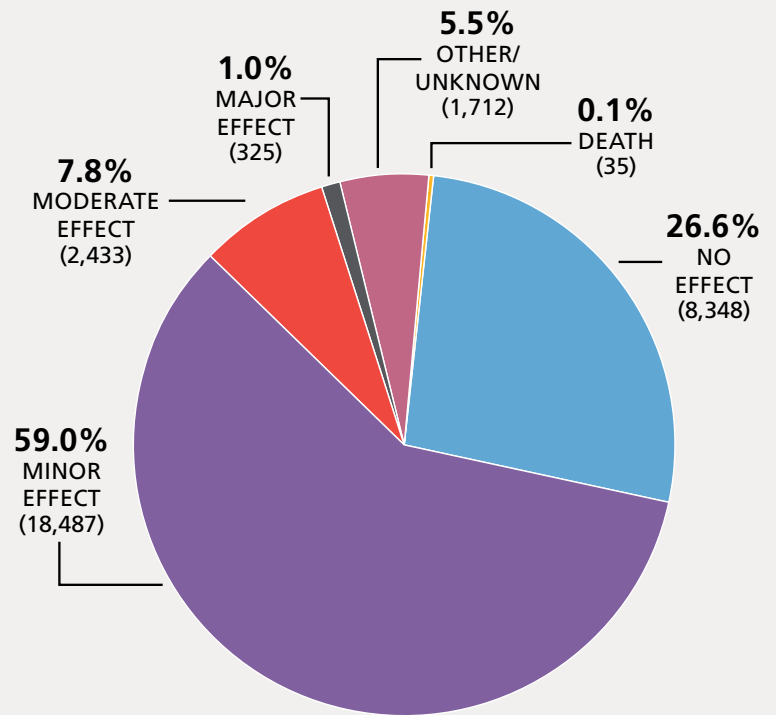
**For Every \$1 Spent on Poison Center Services... \$13 is saved** in health care costs.



# Outcomes

The true measure of the effectiveness of the MPC program is in patient outcomes. Although there were 35 cases (0.1 percent) reported to the MPC that resulted in death in 2015, the impact of the MPC is obvious: few cases had poor outcomes. Some 85.6 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.*



# Research Presentations and Publications

**Klein-Schwartz W, Bentur Y.** Comparison of hyperbaric oxygen treatment reported to poison centers in the U.S. and Israel. European Association of Poison Control Centres and Clinical Toxicologists, Malta. Poster. May 2015.

Desrochers J, **Klein-Schwartz W, Doyon S, Gobburu J, Gopalakrishnan M.** To antidote-or not: Population pharmacokinetic modeling and bayesian forecasting as a tool to predict the need for antidote in acute acetaminophen overdose. American Conference on Pharmacometrics (ACoP), Crystal City, VA. Poster. October 7, 2015.

**Doyon S, Klein-Schwartz W,** Desrochers J, Gopalakrishnan M. Exploratory analysis of data from acute acetaminophen overdoses. North American Congress of Clinical Toxicology, San Francisco. Poster. October 10, 2015.

Spiller HA, Griffith JR, Aleguas A, Ryan ML, Mowry J, Bangh SA, **Klein-Schwartz W, Schaeffer S, Goetz R.** Rivaroxaban and apixaban ingestions reported to 8 poison centers. North American Congress of Clinical Toxicology. San Francisco. Poster. October 10, 2015

**Stassinis G, Anderson BD, Gonzales L, Klein-Schwartz W.** Characterizing the toxicity and dose-effect profile of tramadol ingestions in children. North American Congress of Clinical Toxicology, San Francisco. Poster. October 11, 2015

**Stassinis G, Anderson BD, Gonzales L, Klein-Schwartz W.** Asenapine, iloperidone and lurasidone exposures in young children reported to U.S. poison centers. North American Congress of Clinical Toxicology. San Francisco. Poster. October 12, 2015

**Kaland ME, Klein-Schwartz W.** Comparison of lisdexamfetamine and dextroamphetamine exposures reported to U.S. poison centers. *Clinical Toxicology* 2015; 53:477-85.

**Kaland ME, Klein-Schwartz W, Anderson BD.** Toxalbumin exposures: 12 years' experience of U.S. poison centers. *Toxicol* 2015; 99:125-9.

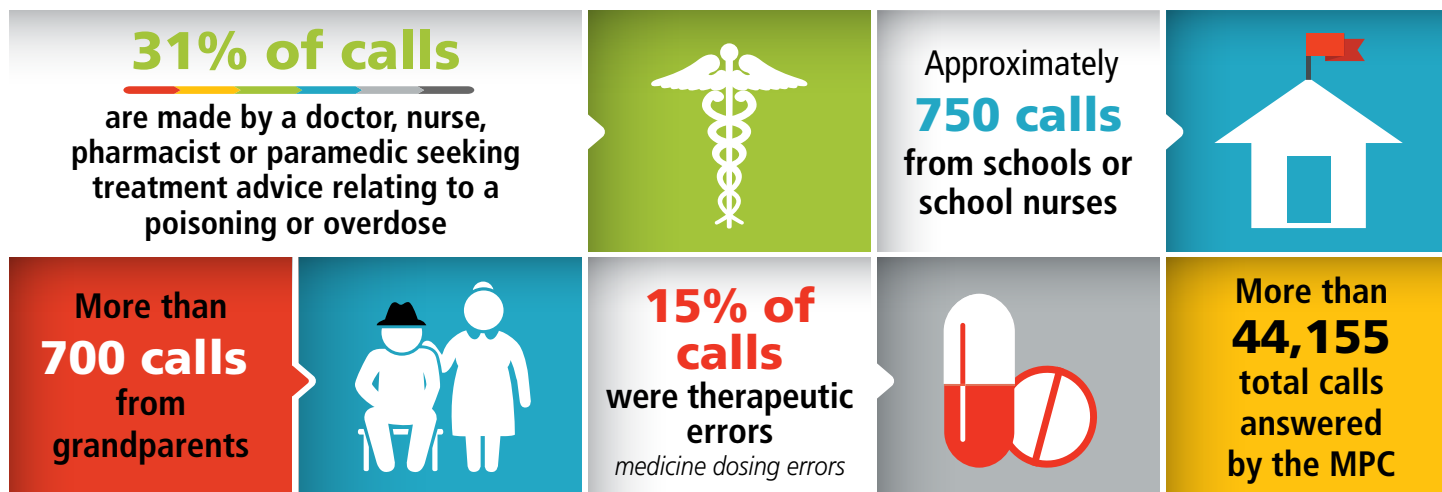
Kurt TL, **Klein-Schwartz W.** Azide poisonings. In: Toxicology of cyanides and cyanogens: Experimental, applied and clinical aspects. 2nd edition, Hall AH, Isom GI, Rockwood GA (editors), West Sussex, Wiley-Blackwell, 2015; pg 330-336.

**Tsay ME, Procopio GL, Anderson BD, Klein-Schwartz W.** Abuse and intentional misuse of promethazine reported to U.S. poison centers: 2002-2012. *Journal of Addiction Medicine*, 2015;9:233-7.

Mowry JB, Spyker DA, Brooks D, McMillan N, and Schauben J. (contributor: **Doyon S**): 2014 Annual Report of the American Association of Poison Control Centers' National Poison Data System (NPDS): 32nd Annual Report. *Clinical Toxicology* 2015;53:962-1147.

Spiller HA, Mowry JB, Aleguas A Jr, Griffith JR, Ryan ML, Bangh S, **Klein-Schwartz W, Schaeffer S, Casavant MJ.** An observational study of the Factor Xa inhibitors rivaroxaban and apixaban as reported to eight poison centers. *Annals of Emergency Medicine* 2015 Aug 19 [E-pub ahead of print].

**Klein-Schwartz W, Stassinis GL, Isbister GK.** Treatment of sulfonylurea and insulin overdose. *British Journal of Clinical Pharmacology* 2015 Nov 9 (E-pub ahead of print].



# 2015 Maryland Poison Center Staff

## **Director of Operations**

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Pedro Gamez

## **Statistician**

Yolande Tra, PhD

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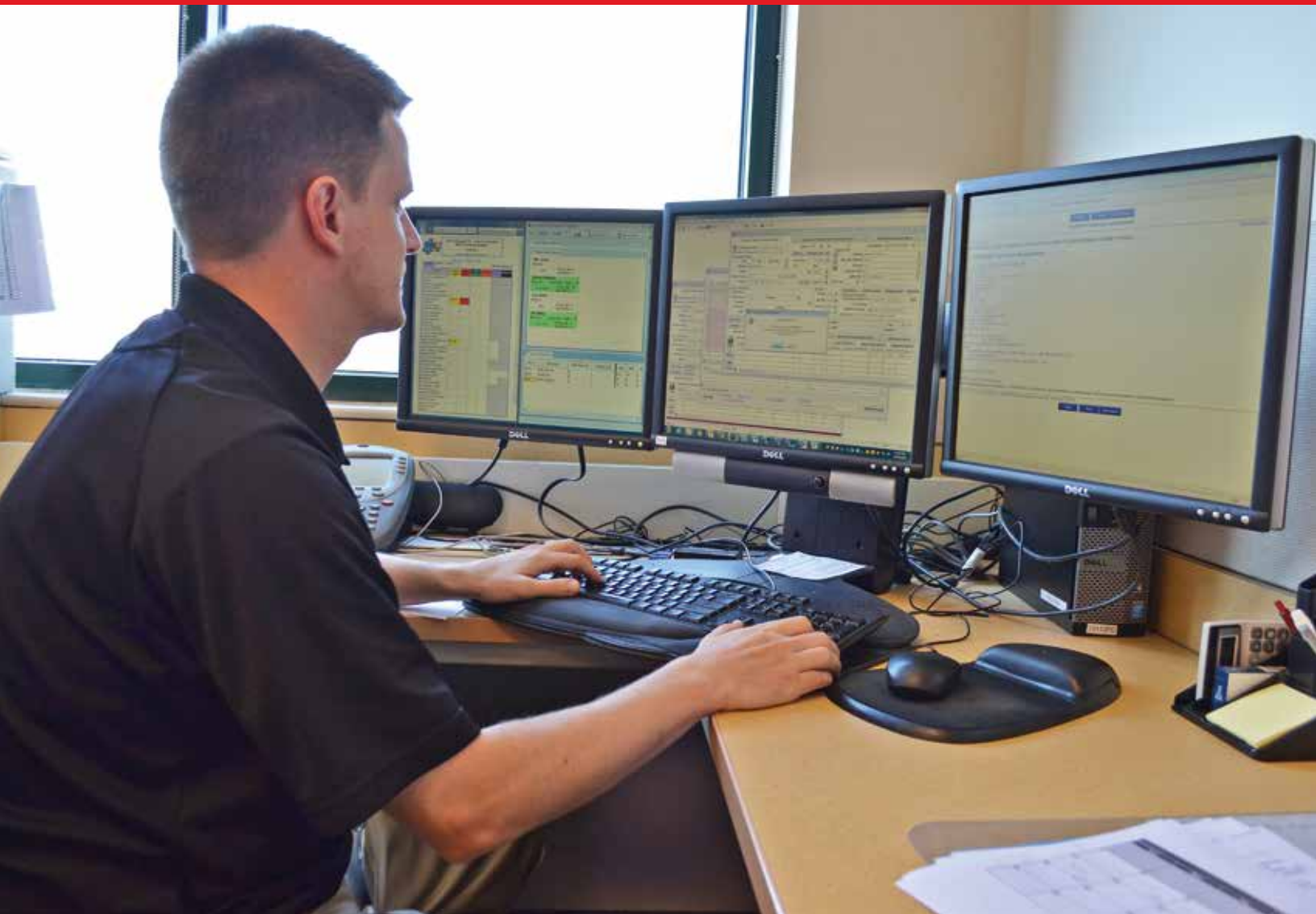
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Nicole Dorsey

Darren Stokes







## Acknowledgments

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- University of Maryland School of Pharmacy
- University System of Maryland
- Maryland Department of Health & Mental Hygiene
- U.S. Department of Health and Human Services, Health Resources and Services Administration
- 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](http://www.mdpoison.com)  
to see how you can  
support the  
Maryland Poison Center.**



# Maryland Poison Center

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