



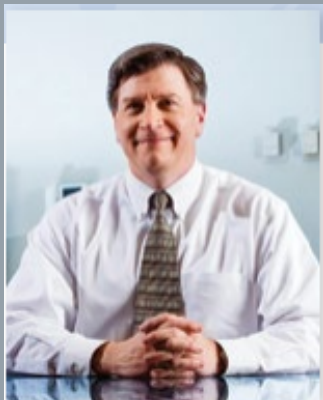
Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

2019 Annual Report



1-800-222-1222
mdpoison.com

From the Executive Director



Welcome to the 2019 annual report of the Maryland Poison Center (MPC)! It is always a treat to be able to present this summary of the many activities that have taken place over the past year. We had a terrific 2019, but it's really hard to think about last year with everything that's happening right now.

When people think of the MPC, they mainly think about the people staffing the center 24 hours a day. They may think about the situations that families have gone through where they've needed to contact the MPC. One common question I hear when people find out what I do for a living is, "What's the most bizarre question you've ever gotten?" The short answer? Too many to even start to think about naming just one. What many people don't realize is that beyond the interesting and challenging cases that we deal with, there are many other people who make this entire operation function properly.

For example, our medical director is an outstanding clinician and individual who has the unique perspective of being trained in internal medicine, nephrology, and medical toxicology. We have outside medical consultants who provide on call medical coverage and who are all medical toxicology-trained physicians, some of whom are not even based on our campus. We have educators who do their best to make sure that all of the approximately 4 million people in our service area know how and when to contact us, but they also provide education to prevent poisonings from ever occurring. We have administrative staff who keep everything moving and who process and ensure delivery of the requests for educational materials. We have two IT staff to support a complex 24-hour a day service that requires around the clock telephone and network support. We have faculty and staff who work with local and state health departments, providing data on MPC cases that may be of public health interest. We have faculty who teach the scores of pharmacy students, nursing and medical students, pharmacy and medical residents, and pharmacy and medical fellows who rotate with the MPC. And, we have a pharmacy fellowship training program to create next generation leaders in clinical toxicology.

All of those individuals support the operations of the center and the pharmacists and nurses covering the phones. Those nurses and pharmacists are dealing with sometimes very complicated patients and doing their best to provide outstanding care to people we never see and for whom we often times get very limited information. We're not with the patients, and yet we're asked for our expert opinion on how best to care for those patients. We have to rely on others to help take care of people. It's a remarkable thing to be able to help care for patients from a distance, with only the voice on the other end of the phone providing us with details. The way that poison centers practice (and in particular, the way that the Maryland Poison Center works) has been excellent training to be able to respond to the challenges of COVID-19.

From the Executive Director

We're used to not having full information about our patients. We're used to not seeing our patients as a way of assessing them. We're used to working remotely. Because of the efforts of our IT staff creating infrastructure over the past several years, and because the poison specialists periodically test those resources, we were ready to work remotely right away when the pandemic hit. We were even able to continue holding daily teaching rounds. In fact, we were able to add trainees to our teaching rounds that are now being held virtually, including one individual who connects from Australia.

The MPC accomplished a great deal in 2019, and we are extraordinarily proud of the work of our faculty and staff. Those individuals then stepped up in major ways to respond to the challenges that we've faced so far in 2020. I could not be more pleased and honored to be able to work with these amazing people.

Sincerely,
Bruce

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



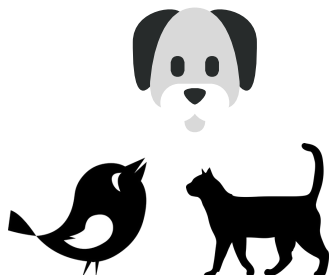
2019 CASES

In 2019, the Maryland Poison Center managed a total of 36,254 cases.



Human Exposures

29,013



Animal Exposures

1,115



Information Calls

6,126

Note: The human exposure data in this report does not reflect approximately 6,000 cases that were misrouted by telecommunication carriers and managed by another poison center.

Human Exposures by County

Allegany	591	2.0%	Harford	1,662	5.7%
Anne Arundel	3,196	11.0%	Howard	1,304	4.5%
Baltimore City	4,425	15.3%	Kent	177	0.6%
Baltimore	4,691	16.2%	Montgomery*	380	1.3%
Calvert	554	1.9%	Prince George's*	482	1.7%
Caroline	199	0.7%	Queen Anne's	248	0.9%
Carroll	1,282	4.4%	Somerset	121	0.4%
Cecil	587	2.0%	St. Mary's	833	2.9%
Charles	715	2.4%	Talbot	376	1.3%
Dorchester	246	0.8%	Washington	1,048	3.6%
Frederick	1,448	5.0%	Wicomico	730	2.5%
Garrett	205	0.7%	Worcester	324	1.1%

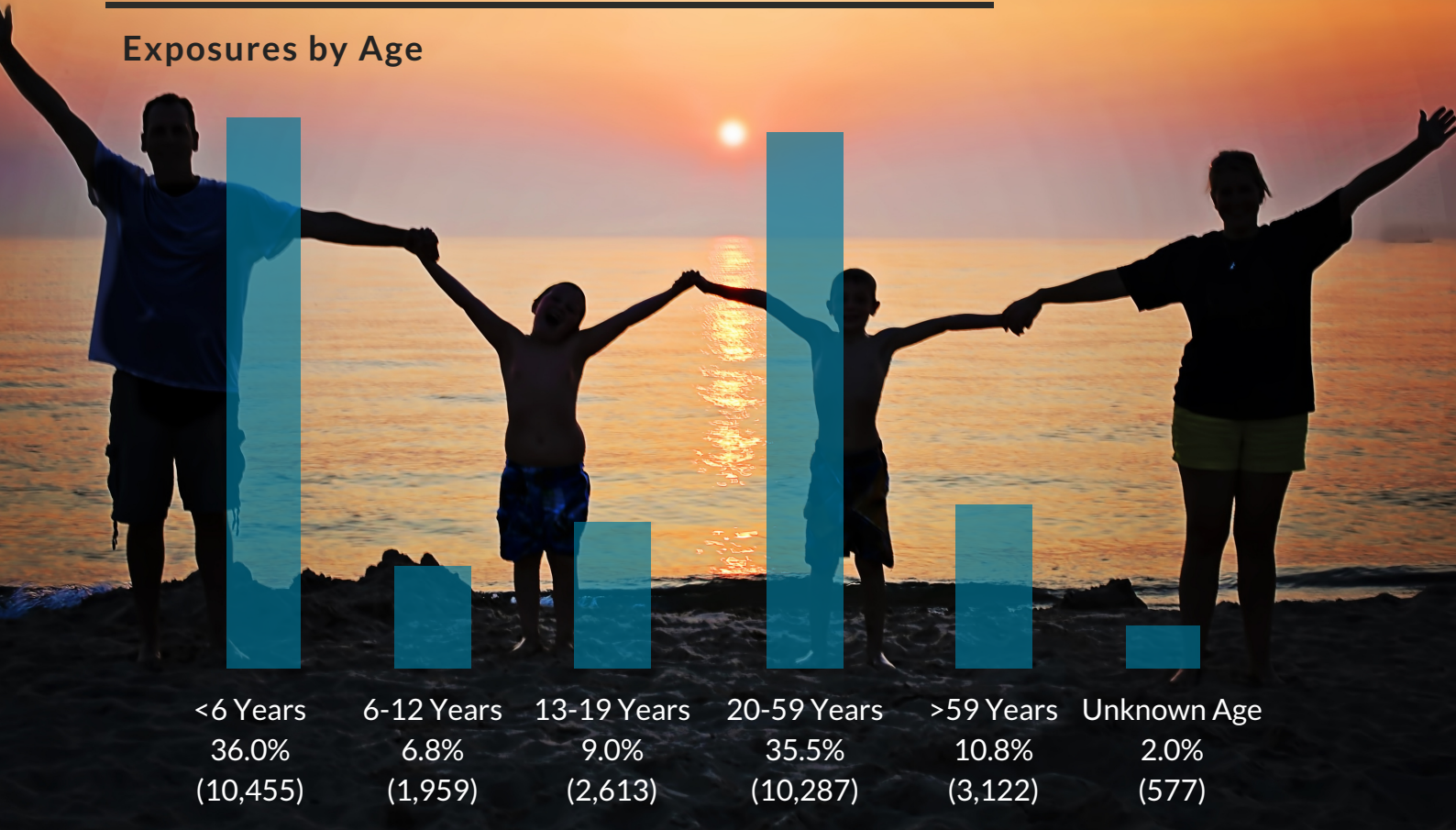
*Numbers for Montgomery and Prince George's counties reflect calls to the MPC only. The 800-222-1222 number automatically connects callers from these counties to the National Capital Poison Center in Washington, D.C. Some callers reach the MPC by dialing local telephone numbers still in service.

Callers from unknown Maryland counties and from other states accounted for 11% of the human exposures in 2019.

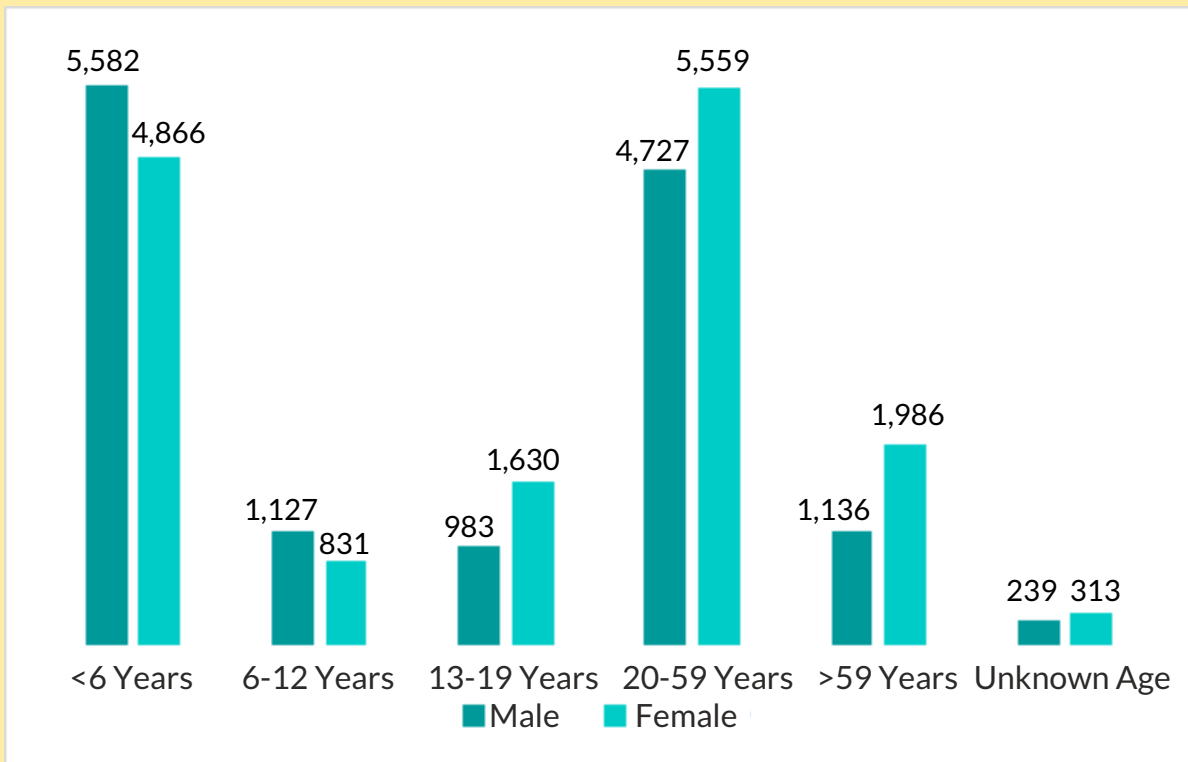
The data for counties is as accurate as possible given that some ZIP codes cross county boundaries.

HUMAN EXPOSURES

Exposures by Age

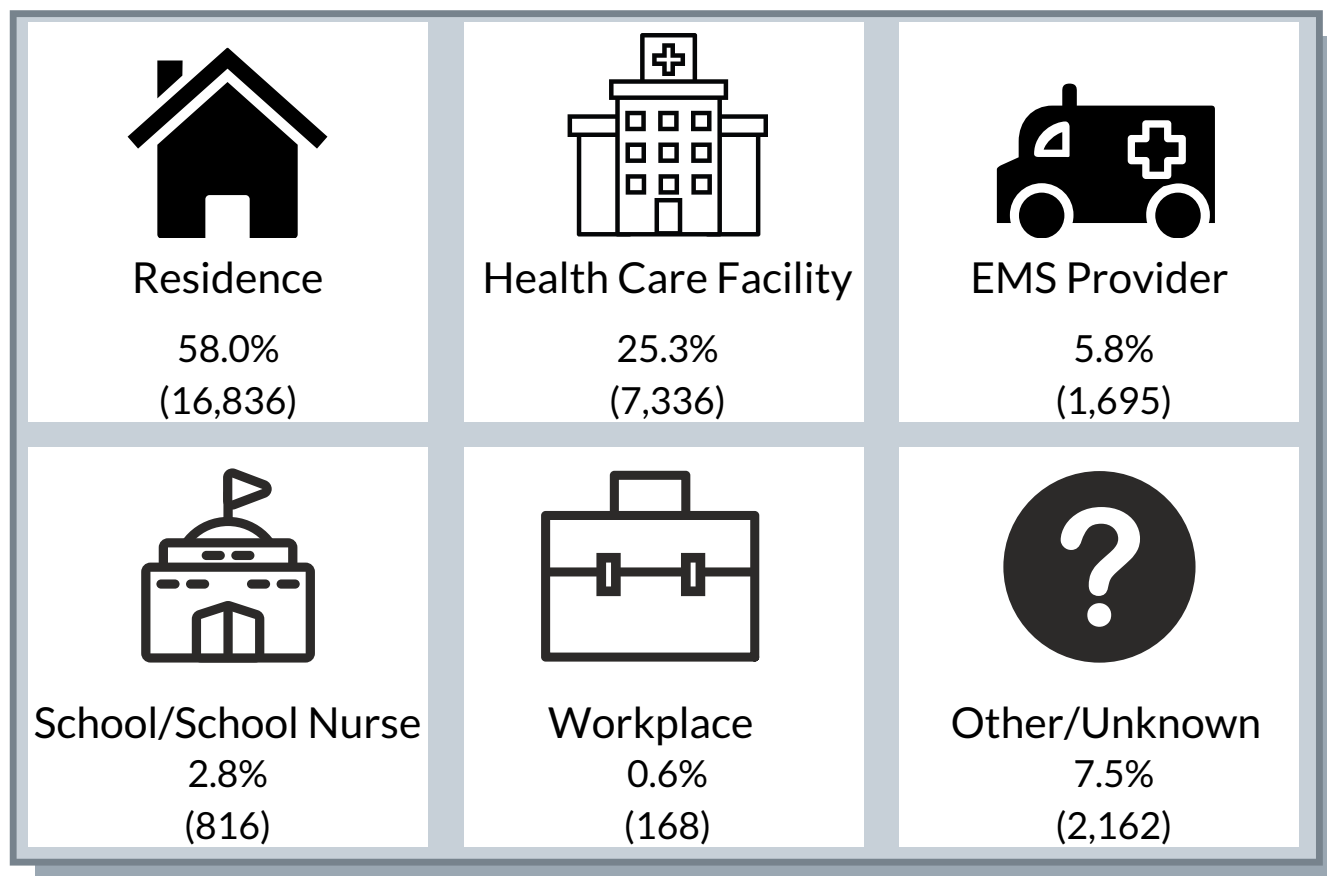


Exposures by Gender



47.5 percent of exposures occurred in males, 52.3 percent in females, and 0.2 percent unknown.

SITE OF CALLER



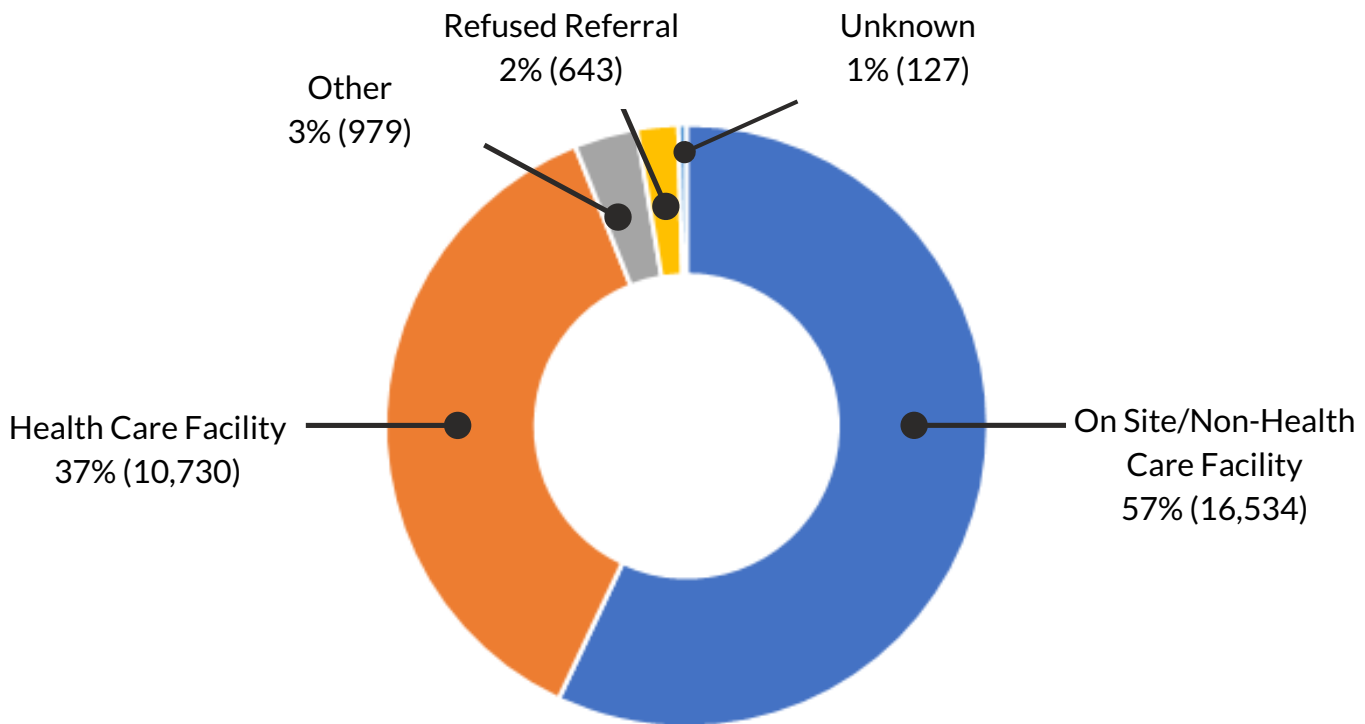
Residence can be the patient's residence or another residence.

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:

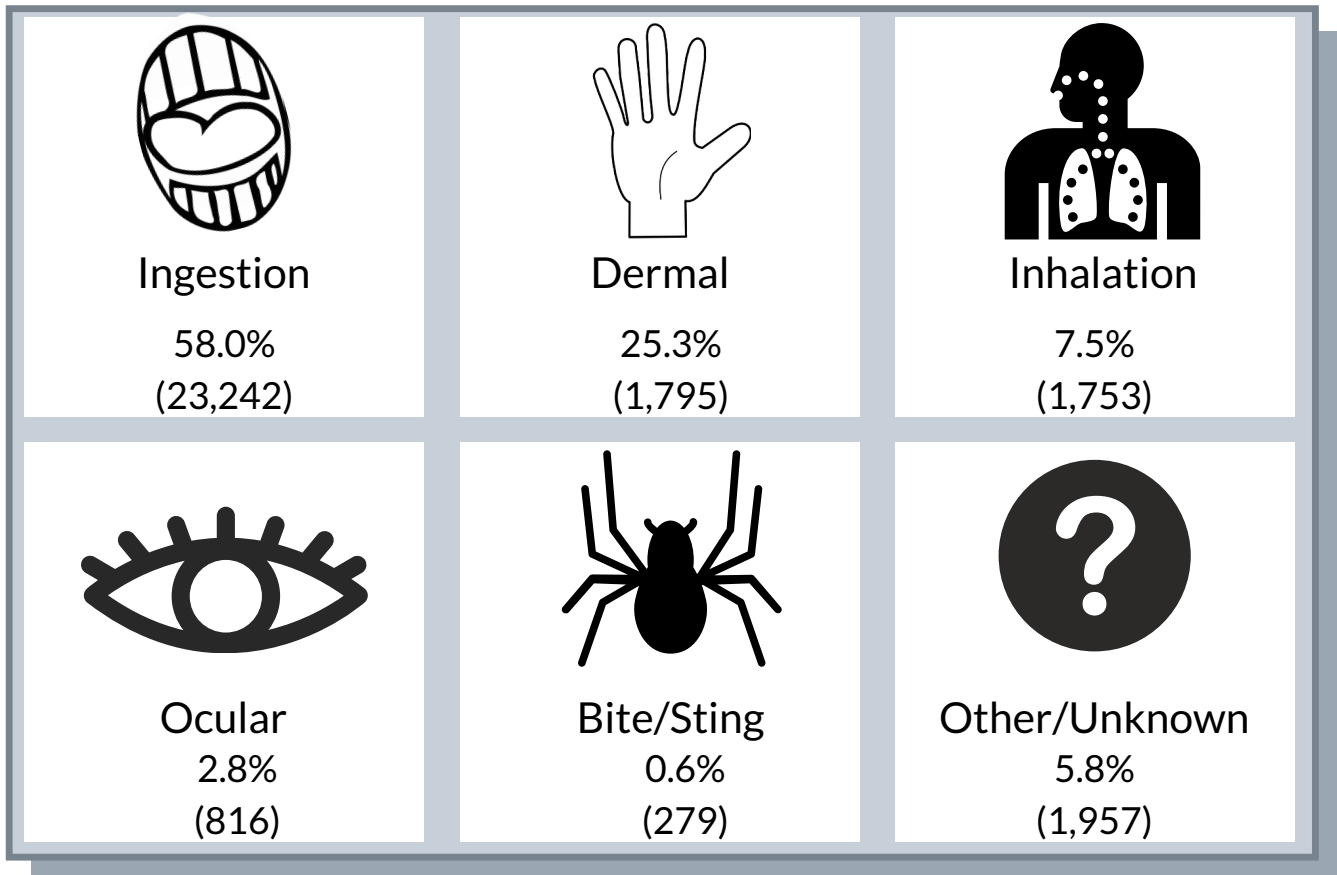
- saves millions of dollars in unnecessary health care costs compared with managing patients in a health care facility
- allows more efficient and effective use of limited health care resources



Of the cases managed in a health care facility, 51.6 percent were treated and released, 7.8 percent were admitted to a critical care unit, 11.5 percent were admitted to a non-critical care unit, 17.5 percent were admitted for psychiatric treatment, and 11.6 percent were lost to follow-up.

In fact, when EMS providers or 911 consult with the MPC about patients, 5 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.

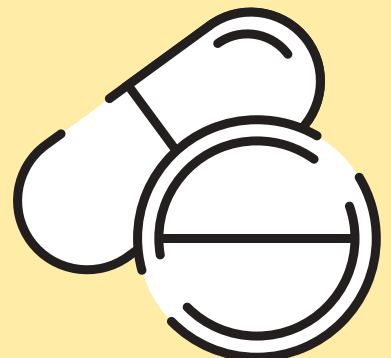
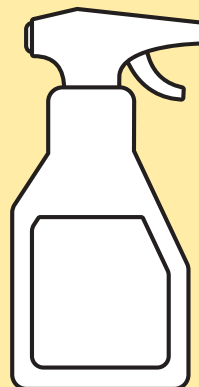
ROUTE OF EXPOSURE*



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

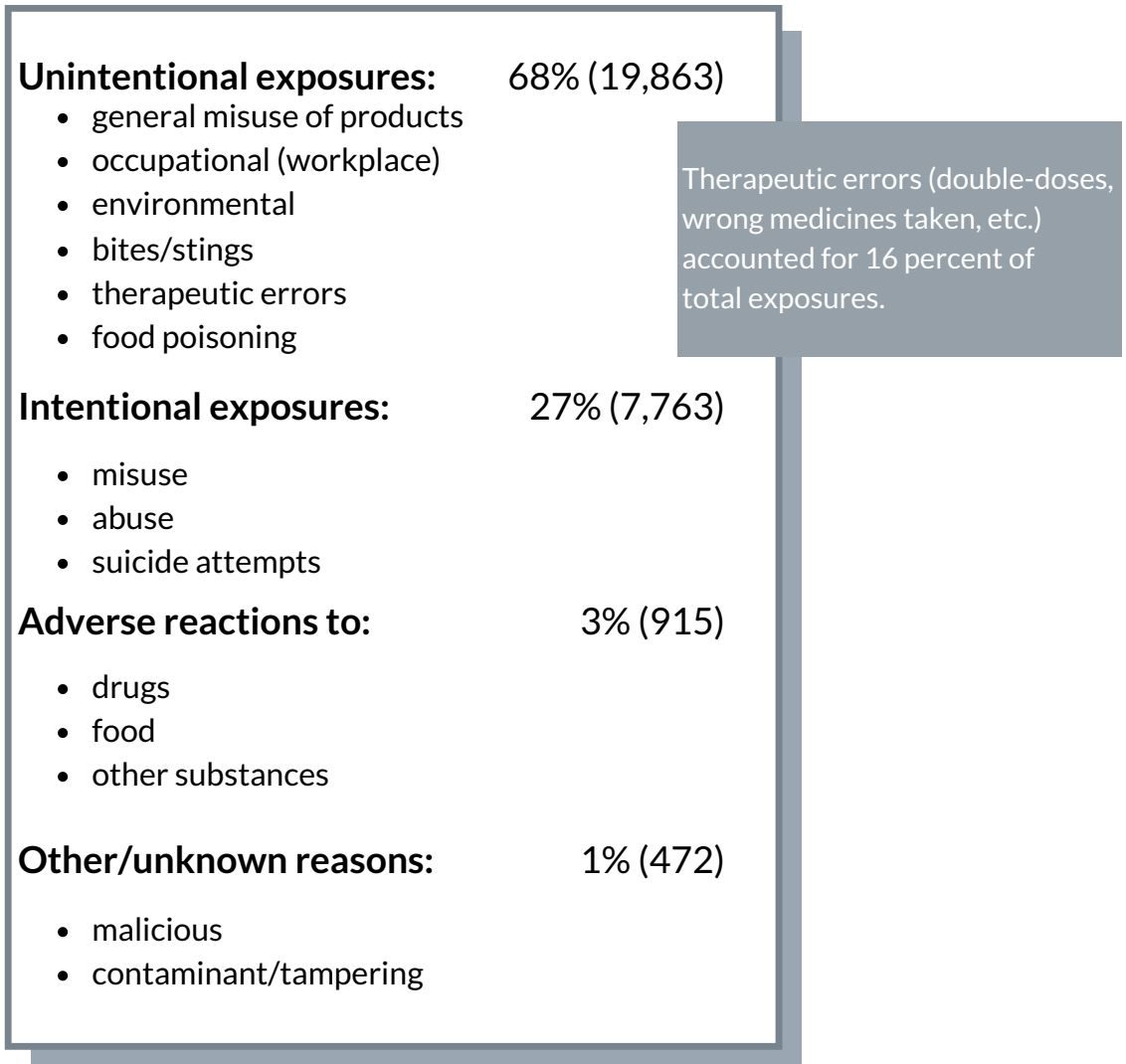
Top 5 Causes of Poisoning

1. Pain Relievers
2. Sedatives, Hypnotics, and Antipsychotics
3. Antidepressants
4. Household Cleaning Products
5. Stimulants and Street Drugs



CIRCUMSTANCE

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



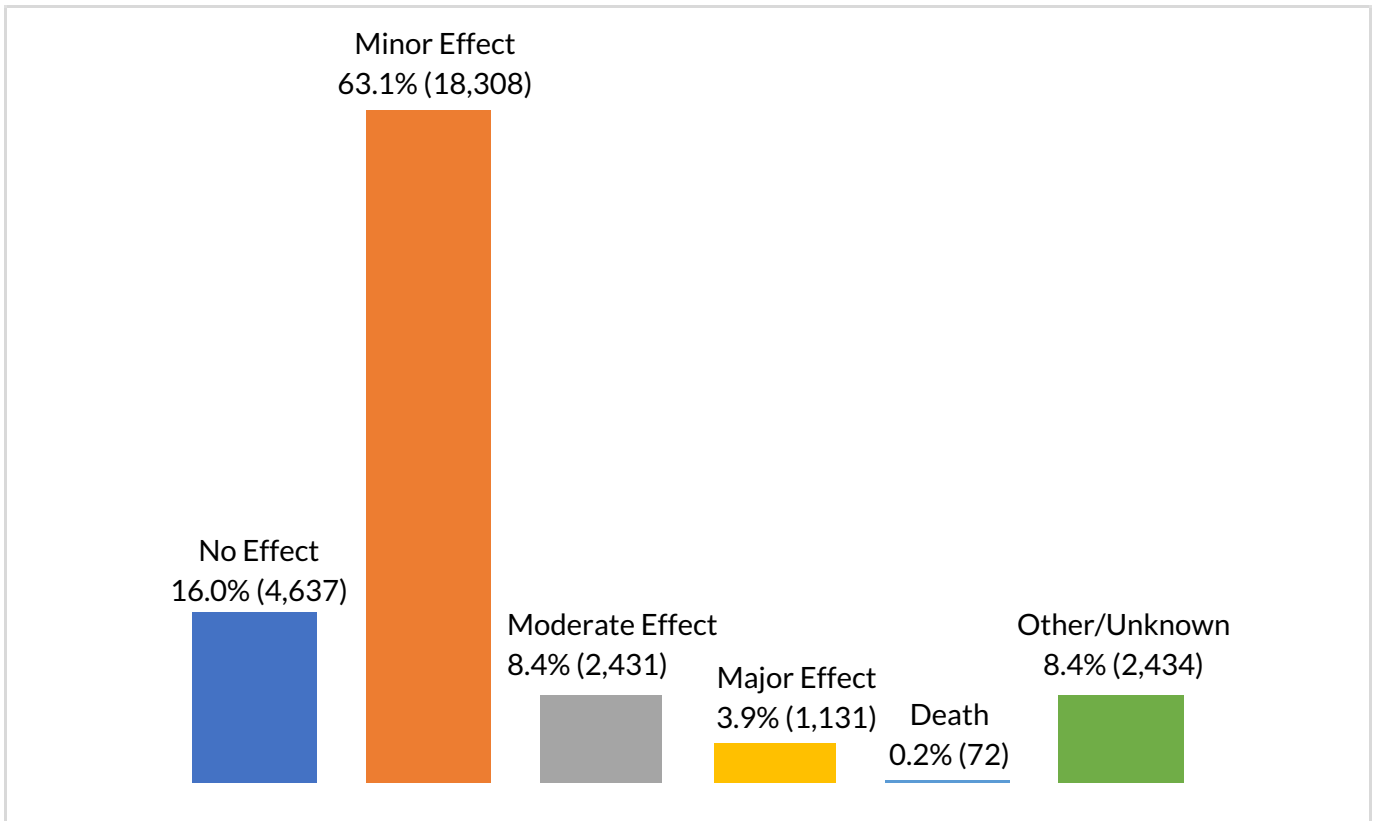
68% of exposure calls were unintentional

99% of exposures in children under 6 years old were unintentional while only 30% of exposures in 13-19 year olds were unintentional

70% of the calls involving older adults were about medicines

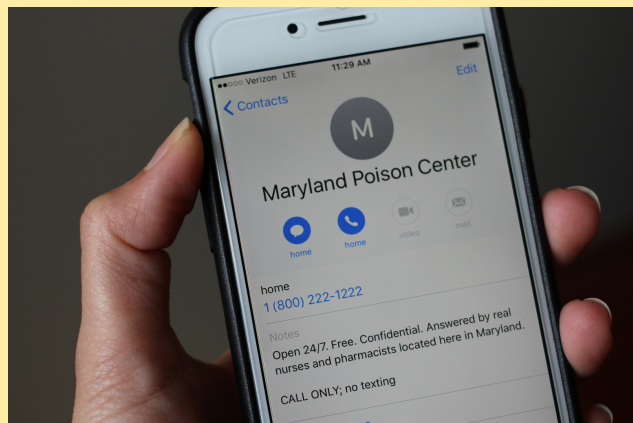
Approximately 600 calls were from grandparents about their grandchildren

MEDICAL OUTCOMES



The true measure of the effectiveness of the MPC is in patient outcomes. Although there were 72 cases reported to the MPC that resulted in death in 2019, 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 2019. A patient may be exposed to more than one substance in a poisoning or overdose case.

Top 10 Drug Substances

	No.	%
Analgesics	4,574	15.8%
Sedatives/Hypnotics/Antipsychotics	2,370	8.2%
Antidepressants	2,242	7.7%
Stimulants/Street Drugs	2,174	7.5%
Cardiovascular Drugs	1,915	6.6%
Antihistamines	1,570	5.4%
Anticonvulsants	1,190	4.1%
Hormones (including diabetes and thyroid medicines)	869	3.0%
Cold and Cough Medicines	751	2.6%
Dietary Supplements/Herbals/Homeopathic	751	2.6%
Others	5,546	19.1%
Total	23,952	82.6%



Some 82.6 percent of the poisoning and overdose calls to the MPC involved a drug, while 46.2 percent of calls involved a non-drug substance.

Top 10 Non-Drug Substances

	No.	%
Cleaning Substances (Household)	2,191	7.6%
Cosmetics/Personal Care Products	2,103	7.2%
Alcohols	1,319	4.5%
Foreign Bodies/Toys/Miscellaneous	1,239	4.3%
Pesticides	887	3.1%
Chemicals	603	2.1%
Plants	568	2.0%
Arts/Crafts/Office Supplies	442	1.5%
Fumes/Gases/Vapors	370	1.3%
Essential Oils	210	0.7%
Others	3,688	12.0%
Total	13,410	46.3%



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

SATISFIED CALLERS

Public:

Lilly replied to the MCP Caller Satisfaction Survey in January 2019: *“Josh* was very warm and friendly collecting the information he needed to help. He educated me on the substance I had introduced to my mouth and his knowledge further reassured me. Your service is invaluable and not only puts minds at ease but saves lives.”*

* Josh Dennis, PharmD, Certified Specialist in Poison Information

Heather wrote on Facebook in April 2019: *“Poison control is the best thing ever. They are always so calming, helpful, and nice! Thank you!”*

Anonymous response to the MPC Caller Satisfaction Survey in May 2019: *“My 24-month-old daughter tried to drink from my essential oil diffuser. I first called the pediatrician who directed me to poison control. Poison control let me know the warning signs of an issue from drinking essential oil, and to watch her over the next few hours. She was fine, but it was nice when poison control called back to check in on her. I have requested the free poison control packet which I will be glad to have around the house in case we ever need it again.”*

Health care professionals:

Anonymous response from a health care professional to MPC Caller Satisfaction Survey in February 2019: *“I have called on two separate occasions and both times who I spoke with was excellent. It is so nice to speak to people that are pleasant. Every time I have called (for work) I have been treated very kind and the staff is exceptionally knowledgeable. Keep up the great work!”*



PUBLIC EDUCATION

Our focus:

- Increase awareness of the poisons found in every home, business, and school.
- Help prevent poisonings from occurring by encouraging safe storage and proper use of household products and medicines.
- Highlight the expertise of the staff of the MPC and that calling will result in fast, free, confidential help.

Public Ed Spotlight: Train-the-Trainer

Our service area covers a majority of the state of Maryland, totaling 4 million people. We have utilized trainers around the state for years to help spread awareness of the MPC and education to prevent poisonings and overdoses. In 2019, we redesigned our train-the-trainer program and included an online database of information and education for trainers. We trained a total of 95 community members in two counties - Anne Arundel and Frederick. Becoming a trained poison center educator equips you with the knowledge and resources to be able to create an educational presentation, display, or interactive activity for people of all ages.



55 programs in 11 counties attended by 3,010 people.

Some of our public education partners:

- State and local health departments
- Healthy Start programs
- State and local Safe Kids coalitions
- Head Start programs
- Fire/Police/EMS
- Schools and childcare providers
- Physicians and hospitals
- Local health improvement coalitions

More than 275,000 pieces of educational materials were distributed.

SOCIAL MEDIA AND WEBSITE

In an attempt to reach more Marylanders with our educational and awareness messages, the MPC continued to expand its social media presence in 2019. We posted regularly on Facebook (@MarylandPoisonCenter) and Twitter (@MDPoisonCtr). Posts often directed followers to information on our website, blog, and YouTube channel.



263 posts on Facebook reaching more than 277,000 people with an increase of 406 followers.



266 tweets leading to more than 168,000 impressions and a 33% increase in followers.



Approximately 2,200 visitors to our e-Antidote blog yielding more than 3,400 page views.



One new original video on YouTube with more than 3,000 views for a total watch time of more than 77 hours.



More than 33,400 people visited the MPC website, yielding approximately 79,000 page views.

Traditional Media

In 2019, the MPC and/or staff appeared in the media at least 13 times. The coverage included web (11), radio (1), and TV (1). Much of the media generated by the MPC in 2019 was related to a lung injury caused by vaping.

HEALTH PROFESSIONAL EDUCATION

Professional education is designed to help clinicians better manage poisoning and overdose cases that end up in a health care facility by providing on-site training for physicians, pharmacists, nurses, and EMS providers. Over the years, we have seen decreases in calls coming from homes and increases in calls coming from health care facilities and first responders. In 2019, nearly one-third of calls to the MPC came from physicians, physician assistants, nurse practitioners, nurses, and emergency medical personnel.

The MPC's Twitter account for health care professionals (@MPCToxTidbits) posted clinical and medical toxicology content relevant for health care providers.



17 programs and webinars reaching more than 725 health care professionals.



120 health professionals came to the MPC in 2019 to learn about the assessment and treatment of poisoned patients.



181 tweets (@MPCToxTidbits) leading to more than 135,000 impressions, more than 3,000 engagements, and an increase of 200 followers.

Program Spotlight: The Maryland Poison Center participates in the University of Maryland Upper Chesapeake Medical Center Emergency Department Preparedness Conference

On Oct. 9, 2019, an Emergency Department Preparedness Conference was held at the Level Volunteer Fire Company in Havre de Grace, Md. More than 50 emergency department nurses and technicians from the Upper Chesapeake Medical Center attended the all-day program of presentations and simulations on managing the many types of patients that present to the emergency department. The Poison Center's presentation - Toxicology in the Community and the Emergency Department - discussed many of the emerging drugs of abuse and their management in intoxicated patients along with a review of reversal agents such as naloxone.

In 2019, the MPC continued our partnership with PharmCon, Inc. and provided 23 webinars on www.FreeCE.com, reaching approximately 26,339 health care professionals. Throughout the years, this partnership has proved to be a valuable means of reaching out to health care providers about the services of poison centers as well as increasing clinical knowledge of the field of toxicology.

TOXTIDBITS AND POISON PREVENTION PRESS

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 2019 include:

- Cough and Cold Medicine Safety
- Top 3 Poisons of 2018: Children
- Top 3 Poisons of 2018: Adults and Older Adults
- Understanding Safe Storage
- Take Charge of Your Health
- What You Should Know About Marijuana (Cannabis)

Poison Prevention Press is sent to e-mail subscribers who are encouraged to post and share the newsletter with others. In 2019, the contact list gained 59 new recipients.



ToxTidbits is a monthly newsletter for health professionals containing important toxicology information, updates, and news. Some of the topics addressed in 2019 include:

- Xylazine
- Ethylene Glycol and the Lactate Gap
- Anavip for Timber Rattlesnake Envenomation
- Dinitrophenol
- E-cigarette, or Vaping, Associated Lung Injury
- Pediatric Vilazodone Ingestions: A Medical Emergency

ToxTidbits is sent to email subscribers and faxed to every emergency department in our service area. In 2019, the contact list gained 132 new recipients.



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 PUBLICATIONS AND PRESENTATIONS

Journals

Leonard JB, Hines EQ, Klein-Schwartz W. Iron Packaging Regulations in the United States and Pediatric Morbidity: A Retrospective Cohort Study. *Clinical Pediatrics*. Accepted.

A. Grazioli, S.R. Shah, J. Rabin, R. Shah, R.J. Madathil, **J.D. King**, L. DiChiacchio, R.P. Rector, K.B. Deatrck, Z. J. Wu, D.L. Herr. High-efficiency, High-flux In-line Hemofiltration Using a High Blood Flow Extracorporeal Circuit. *Perfusion*. 2019 Sep 16

Leonard JB, Anderson BD, Duwell A. Challenges with Uptake of Critical Health Messages to Healthcare Providers During an Outbreak of a Novel Health Condition. *Clinical Toxicology*. 2019. <https://doi.org/10.1080/15563650.2019.1709644>

Mahonski SG, **Leonard JB**, Gatz JD, Seung H, Haas EE, Kim HK. Prepacked Naloxone Kit Administration for Suspected Opioid Overdose in the Era of Illicitly Manufactured Fentanyl: A Retrospective Study of Regional Poison Center Data. *Clinical Toxicology (Phila)*. published online 2019

Leonard JB, Anderson, BD. Pediatric Ingestions. In *PharmacotherapyFirst: A Multimedia Learning Resource*. Eds. Barbara Crouch. https://doi.org/10.21019/pharmacotherapyfirst.ped-ingest_overview.

Leonard JB, Kruger Howard A, **Hines EQ**. Toxicity of Acute Exploratory Amphetamine-salt Medication in Amphetamine-naïve Pediatrics: A Retrospective Cohort Study. *Clinical Toxicology (Phila)*. <https://doi.org/10/1080/15563650.2019.1703997>

Leonard JB, Klein-Schwartz W. Characterization of Intentional-abuse Venlafaxine Exposures Reported to Poison Control Centers in the United States. *American Journal of Drug and Alcohol Abuse* 2019; 11: 1-6.

Minhaj F, King JD, Anderson BA, Leonard JB. Outcomes of Acute Exploratory Pediatric Lithium Ingestions. *Clinical Toxicology (Phila)*. Epub ahead of print. <https://doi.org/10/1080/15563650/2019.1704722>

J. D. King, M. H. Kern. B. G. Jaar. Extracorporeal Removal of Poisons and Toxins. *Clinical Journal of the American Society of Nephrology*. 2019 Sept 14(9):1408-1415.

RESEARCH PUBLICATIONS AND PRESENTATIONS

Posters

Leonard JB, Buckley TB, Gorman EF, Klein-Schwartz W. The Penetration of Literature Describing Bupropion-related Harm after Overdose in the Non-toxicology Related Literature: A Scoping Review (abstract). North American Congress of Clinical Toxicology. Nashville, Tenn. September 2019.

Leonard JB, Hines EQ, Deatrick KB, Prybys K, Kim HK. Use of Veno-arterial Extracorporeal Membrane Oxygenation in Life-threatening Bupropion Ingestion in a Pediatric Patient. Congress of the European Association of Poison Centres and Clinical Toxicology, Naples, Italy. May 22-24, 2019.

Leonard JB, Klein-Schwartz W. Analysis of Fatal Iatrogenic Therapeutic Errors Reported to United States Poison Centers (abstract). Congress of European Association of Poison Centres and Clinical Toxicologists. Naples, Italy. May 22-24, 2019.

Leonard JB, McFadden C, Klein-Schwartz W. Steel yourself! Trends in Iron Packaging Regulations in the United States and Pediatric Morbidity. Congress of the European Association of Poison Centres and Clinical Toxicology, Naples, Italy. May 22-24, 2019

Megeed A, Lange RL, **Leonard JB, Hines EQ, Klein-Schwartz W.** Analysis of Initial Management of Unintentional Pediatric Sulfonylurea Exposures Reported to Two Poison Centers (abstract). North American Congress of Clinical Toxicology. Nashville, Tenn. September 2019

Millwee E, Mestas R, Leonard JB. Nicotine Pod Ingestions, A Clinical Conundrum: A Case Series (abstract). North American Congress of Clinical Toxicology. Nashville, Tenn. September 2019.

Leonard JB, Howard AK, Hines EQ. Assessment of Weight-based Dose Resulting in Toxicity after Unintentional Pediatric Ingestions of Amphetamines (abstract). North American Congress of Clinical Toxicology. Nashville, Tenn. September 2019.

Presentations

Elizabeth Quaal Hines, MD

AACT/ACMT Pediatric Special Interest Section Symposium: The Effects of Prenatal Addiction on Children from Conception through Early Childhood; North American Congress of Clinical Toxicology. Nashville, Tenn. Sept. 26, 2019

Emily Paterson, BS, CHES

Using Health Behavior Theories to Design and Evaluate a Poison Prevention Program; North American Congress of Clinical Toxicology. Nashville, Tenn. Sept. 26, 2019

Bruce D. Anderson, PharmD, DABAT, FAACT

Moderator: AAPCC Scientific Symposium: "Moonshine: Past, Present, Future"; North American Congress of Clinical Toxicology. Nashville, Tenn. Sept. 26, 2019

MARYLAND POISON CENTER STAFF 2019

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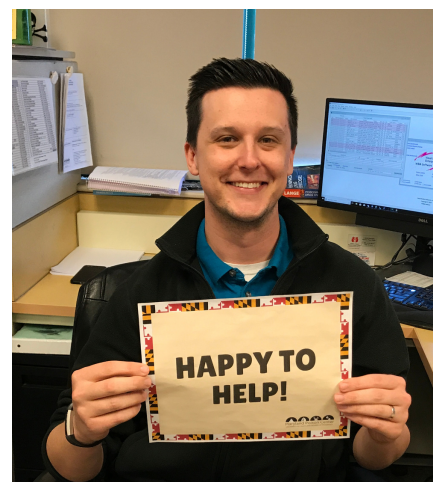
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Acknowledgments

The following organizations deserve special thanks for their continued support of the Maryland Poison Center:

- University of Maryland School of Pharmacy
- University System of Maryland
- Maryland Department of Health
- 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.
- Baltimore County Department of Aging
- Partnership for a Safer Maryland

Call 410-706-7604 or visit www.mdpoison.com to see how you can support the Maryland Poison Center.

1-800-222-1222
mdpoison.com