Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

2020
Annual Report

1.800.222.1222
www.mdpoison.com

From the Executive Director

It is incredibly difficult to succinctly summarize everything that occurred during 2020 into a few paragraphs, but the overarching theme that best summarizes the Maryland Poison Center's (MPC) experience during this past year is adaptability.

2020 was the first time that our physical center had ever been completely empty of staff. When UMB made the decision to require the majority of faculty and staff to work virtually in March 2020, we did so with trepidation. We packed up what we thought was needed and switched our service from in-person to remote. The MPC had previously established processes for poison specialists to take calls from home for relatively short periods of time, such as during snowstorms or for other temporary coverage. And even when we have had big storms, we have had at least one person in the center to help manage calls that we receive from the EMRC - the special phone that allows medics in the field to connect with the base hospital as well as additional consultants at the MPC. That special phone is not part of our phone system, and calls can't be forwarded outside the MPC. We had never had the entire MPC working remotely before. We didn't REALLY know if the processes that we'd set up would all work and continue to work for as long as they were needed. Thanks to the efforts of our IT gurus, Larry Gonzales and Pedro Gamez, our remote systems performed as expected. Thanks also to our poison specialists who adapted to the need to work remotely and made it work even though it is not the same as being on site.

Once MPC operations were initially addressed, we then needed a plan to accommodate our students and residents. How were we going to ensure that we could deliver the type of education that our learners need and expect? Through the efforts of Jimmy Leonard, one of our clinical toxicologists; Faisal Minhaj, a second-year fellow, and Josh King, our medical director, we modified and actually expanded the educational experiences that our students and residents receive. Jimmy and Josh leveraged WebEx and an iPad to deliver outstanding educational content online. And, because the content was being delivered via WebEx, we were able to add residents who suddenly needed training because they were no longer allowed in patient care areas. We were even able to accommodate a kidney researcher from Australia in our daily teaching rounds!

We also needed a plan to accommodate the fourth-year pharmacy students who were scheduled to be on rotation in the MPC. The solution? We recreated the remote workstation set up that the poison specialists use, worked with the campus to allow these students to securely access our network, and figured out how to transfer the equipment and the knowledge to the students. Pedro Gamez has taken the lead on making sure the students have what they need and the access that they need to be successful in the rotation. Jimmy Leonard created new training materials for the students on how to use our electronic medical record software. Eric Schuetz, our coordinator of health professional education, found dozens of previous cases for students to review to help in their orientation.

For the typical on site experience, we pair students with a poison specialist to ensure that the student is supported and that every caller gets accurate information. We had to figure out how to maintain this experience while not being in the same place. We used Microsoft Teams to allow students and poison specialists to connect via audio at the same time the students are taking calls. Nearly all of the poison specialists have worked with our students remotely to support them when they're actively taking calls.

The poison specialists needed to adapt from doing their challenging work on site to working at their home offices, sometimes while taking care of children, parents, and pets. They needed to do this without having the easy ability to run a question by another poison specialist or toxicologist who was in the office with them. They used Microsoft Teams to communicate those questions among the rest of the staff, the toxicologists or fellows. The administrative team had to figure out how to conduct MPC business despite not being in the office regularly. We realized that we really did need someone to go into the office at least weekly to deal with the requests for educational materials, the finances, and the other assorted tasks that need to get done in a timely manner. Administrative staff Nicole Dorsey and Patricia Campbell rotated going into the office to make sure that orders for materials were addressed and that invoices were paid. Emily Paterson, public education and communication specialist, maintained an active MPC presence on social media. Eric Schuetz worked with first responders and other groups outside the campus looking for education and training on taking care of poisoning patients. Angel Bivens, assistant director of operations and public education, coordinated employee work schedules, figured out their needs, and found ways to get everyone what they needed. After more than a year of this adaptation, there were some important lessons learned and some opportunities that became apparent.

We learned that we can do the job with the right resources from just about anywhere. We learned how to adjust our teaching so that we can be effective, even if we are not physically in the same space. We worked with the poison centers in New Jersey and Philadelphia to create a new clinical toxicology training consortium to help ensure that our trainees receive an amazing didactic toxicology experience. That consortium will be continuing (and could be expanding) once we are back on site.

We learned that when everyone works together, amazing things happen!

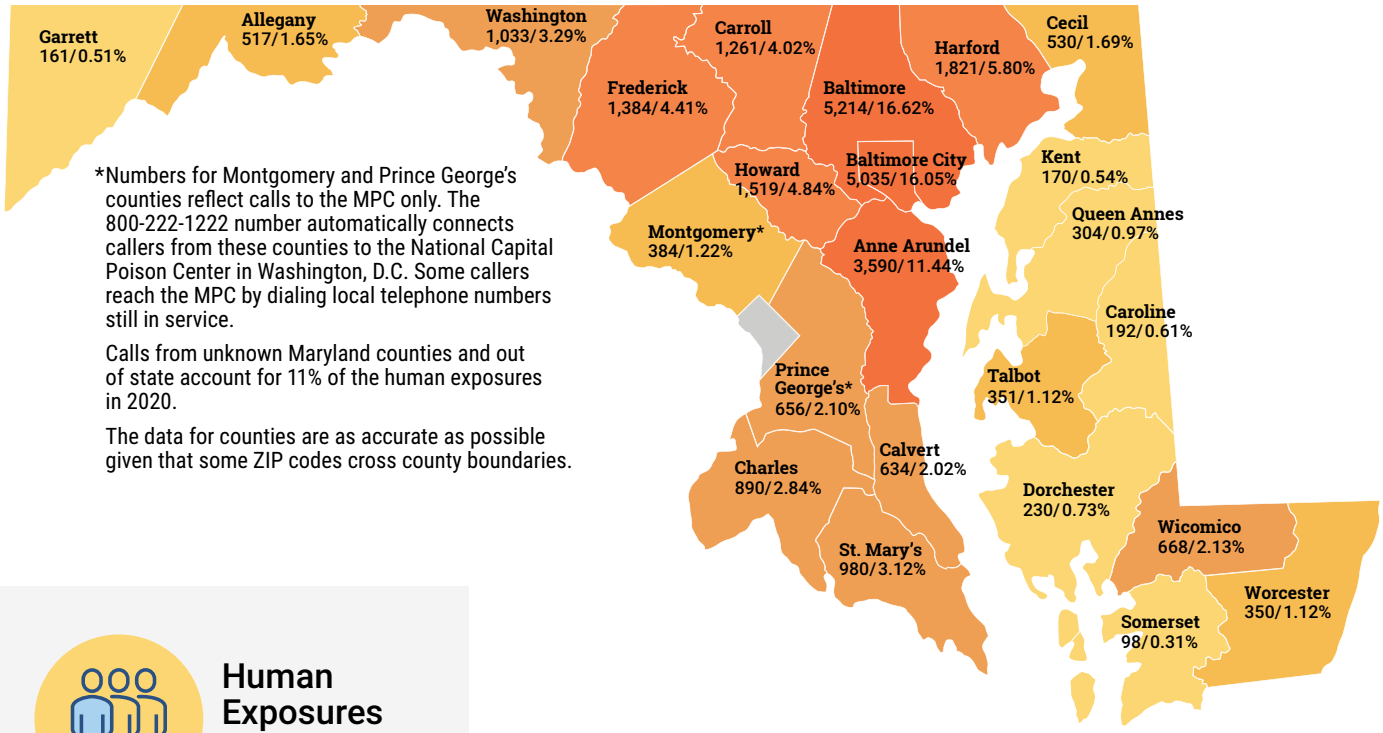
This past year has been a terrific opportunity to see the MPC staff pull together to deal with the challenge that COVID-19 presented. That challenge was accepted and met. I could not be prouder of the work that everyone in the MPC has done and continues to do. The last year has demonstrated adaptability in action.

Sincerely,

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 2020, the Maryland Poison Center (MPC) managed a total of **39,551** cases.



*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.

Calls from unknown Maryland counties and out of state account for 11% of the human exposures in 2020.

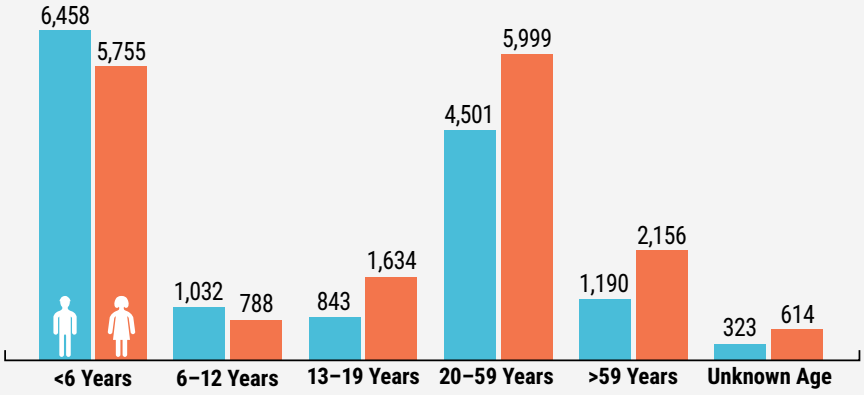
The data for counties are as accurate as possible given that some ZIP codes cross county boundaries.

Human Exposures
31,377

Information Requests
6,990

Animal Poisonings
1,184

Exposures By Gender



Males **45.7%**

Females **54%**

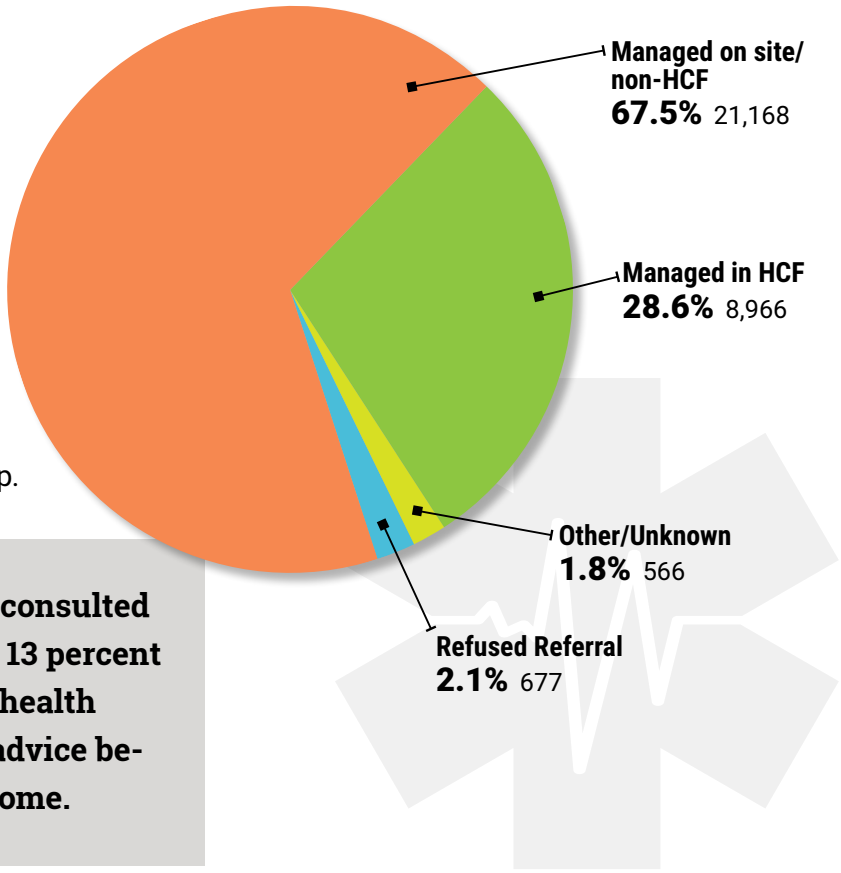
Unknown **0.3%**

Management Site

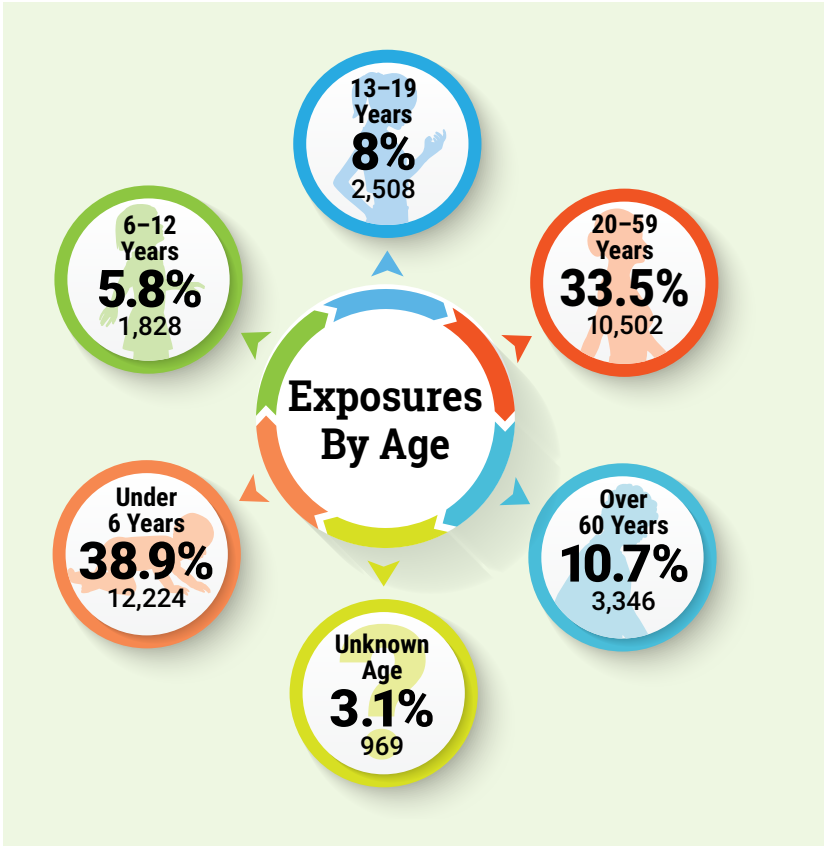
Managing cases safely at home:

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

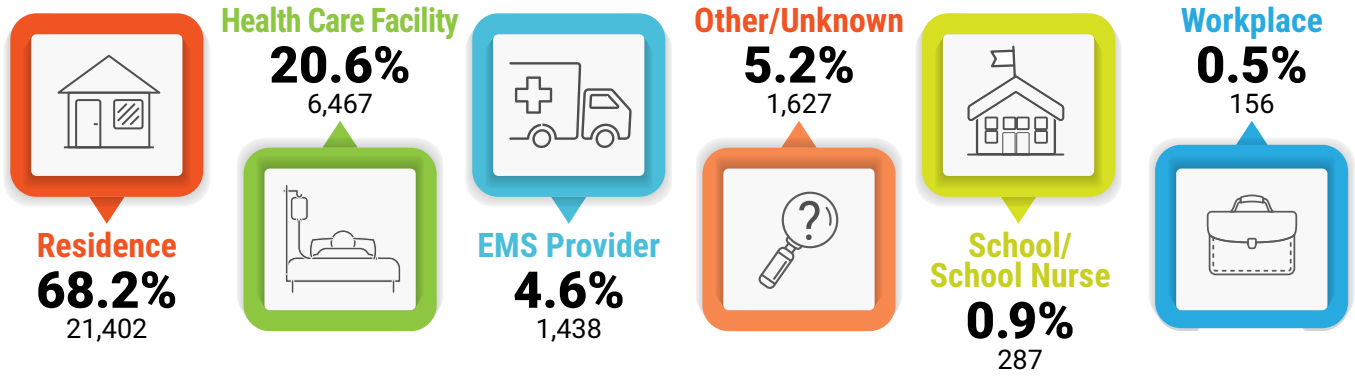
Of the cases managed in a health care facility, 52.5 percent were treated and released, 8.4 percent were admitted to a critical care unit, 13.6 percent were admitted to a non-critical care unit, 17 percent were admitted for psychiatric treatment, and 8.4 percent were lost to follow-up.



In fact, when EMS providers or 911 consulted with the MPC in 2020 about patients, 13 percent of those patients were not taken to a health care facility based on poison center advice because they were managed safely at home.



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).

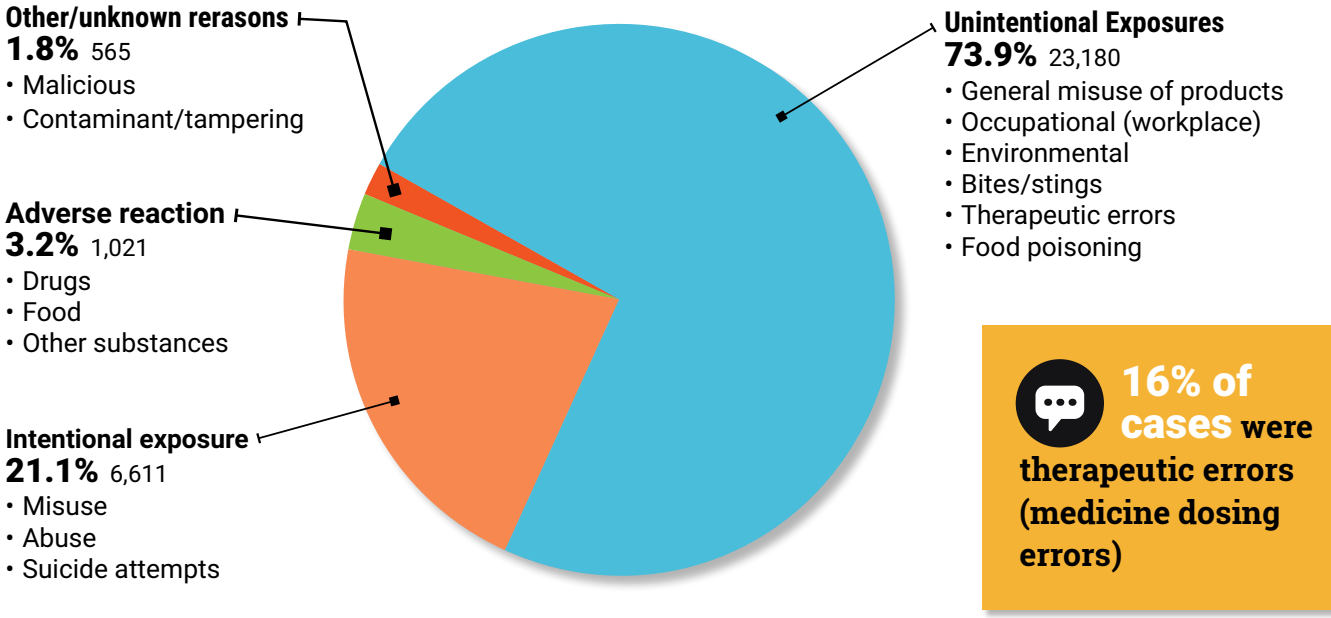
74% of exposure cases were "unintentional"

2,272 cases involving older adults were about medicines (this is 68% of the cases about older adults!)

Circumstance

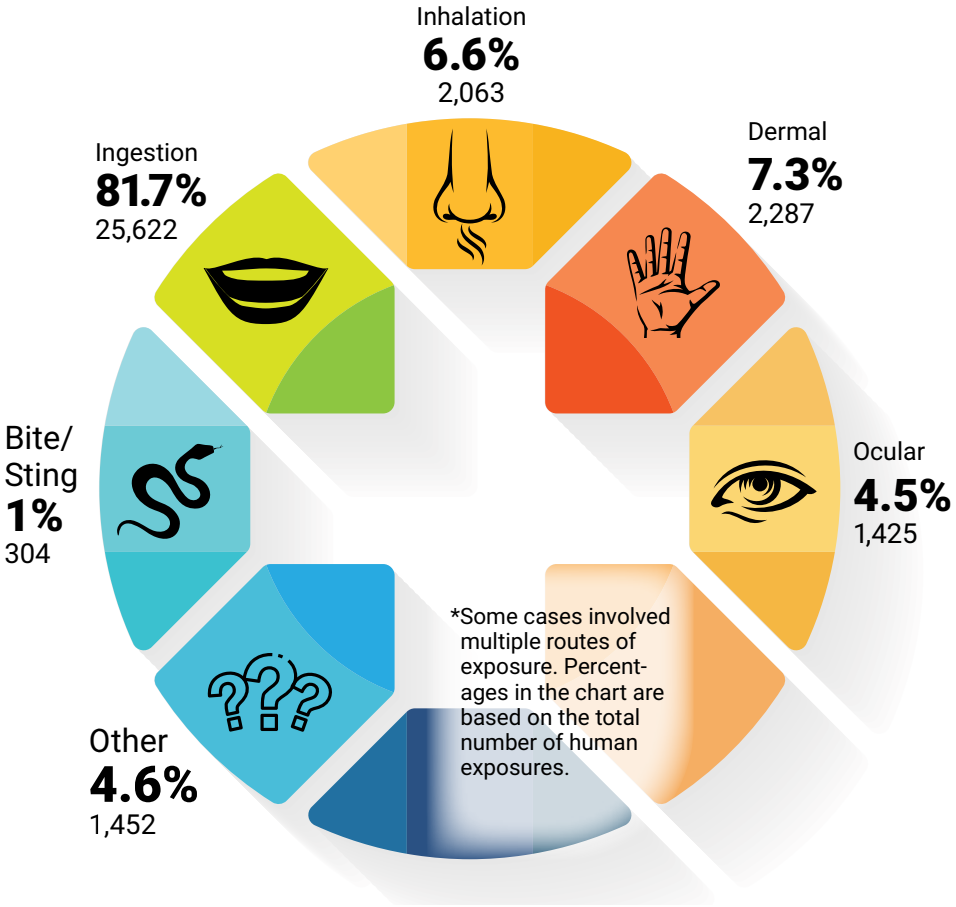
People who contact the MPC have several different reasons for calling.

Reasons for poison exposures differ by age. In young children (under 6 years), 99 percent of exposures were unintentional, while in teens (13-19 years), only 31 percent of exposures were unintentional. Exposures in adults (20-59 years) were split more evenly with 51 percent being unintentional and 40 percent being intentional. In tweens (6-12 years) and older adults (60 years and older), most exposures were unintentional (89 percent and 75 percent respectively).



16% of cases were therapeutic errors (medicine dosing errors)

Route of Exposure*



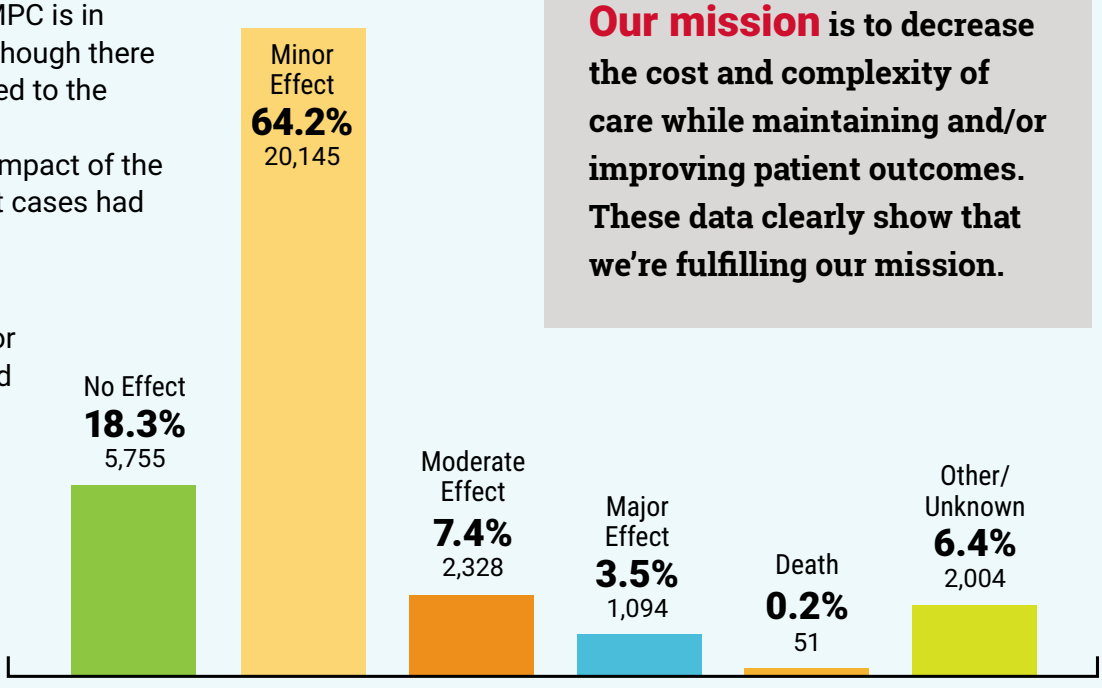
Approximately 300 cases were reported by schools or school nurses

25% of cases were reported by a doctor, nurse, pharmacist or paramedic seeking treatment advice relating to a poisoning or overdose

Medical Outcomes

The true measure of the effectiveness of the MPC is in patient outcomes. Although there were 51 cases reported to the MPC that resulted in death in 2020, 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.



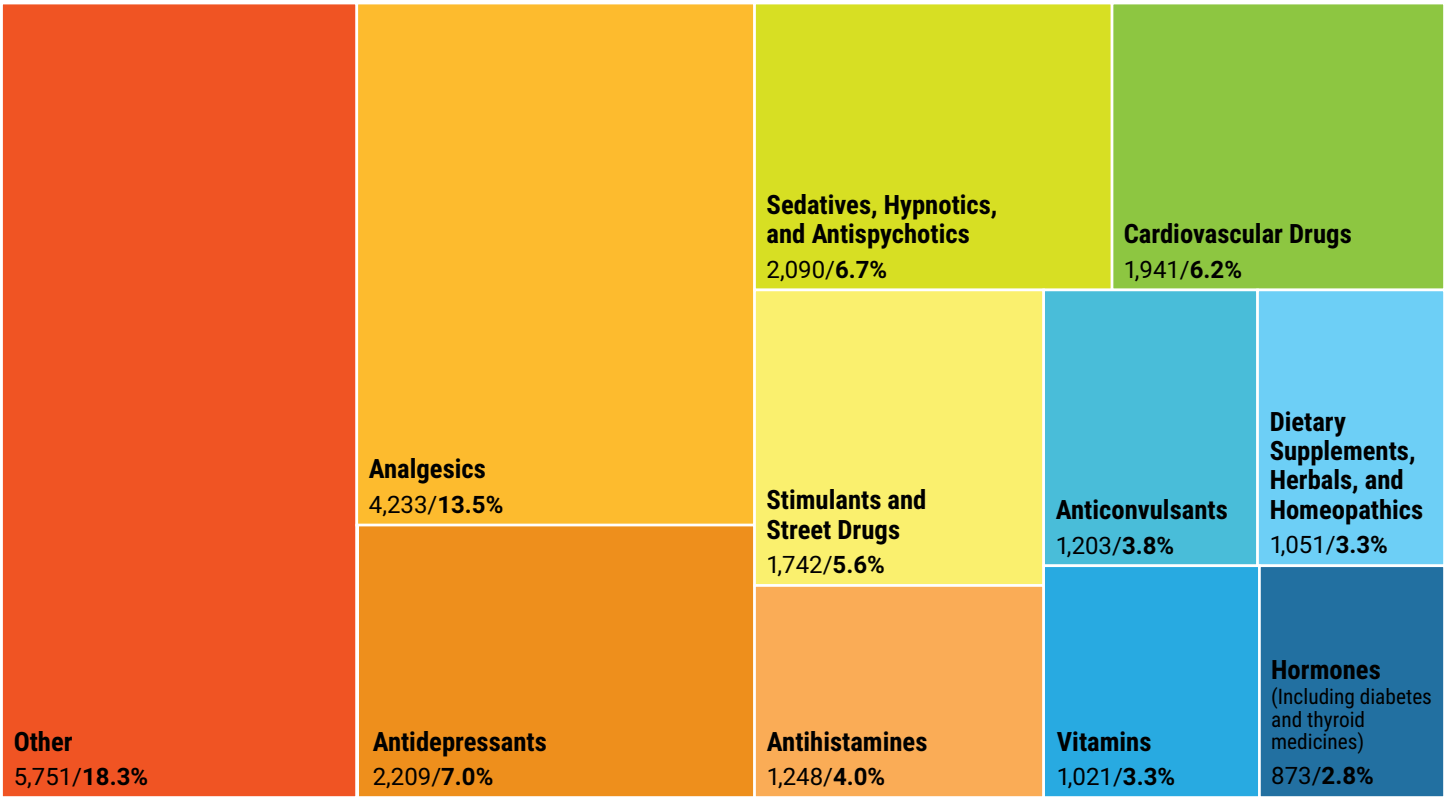
Our mission is to decrease the cost and complexity of care while maintaining and/or improving patient outcomes. These data clearly show that we're fulfilling our mission.

Substances Involved in Poisonings

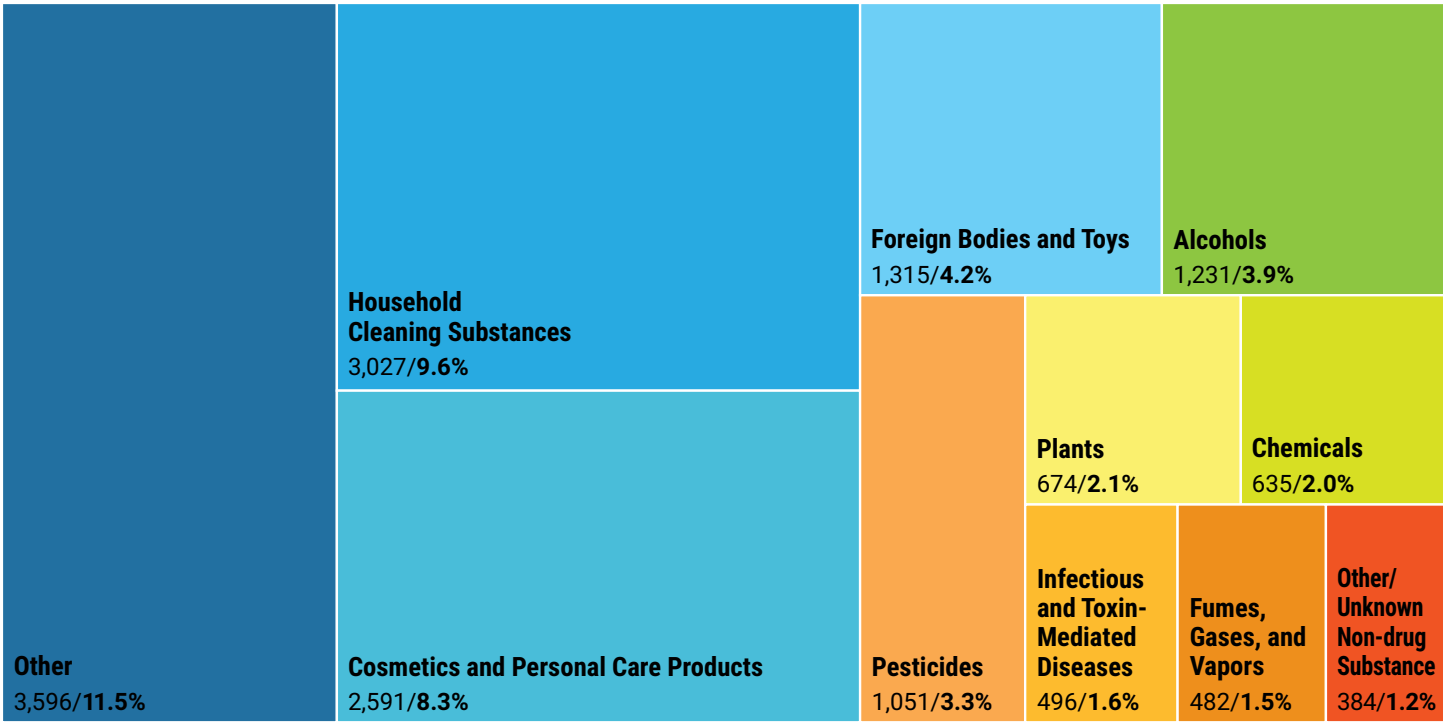
The diagrams below list the most common substances involved in poisonings and overdoses reported to the MPC in 2020. A patient may be exposed to more than one substance in a poisoning or overdose case.

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

Top 10 Drug Substances



Top 10 Non-Drug Substances



Satisfied Callers

Public

Beth wrote on Facebook in May 2020:

"I spoke with Elizabeth several times a few years back after a scare I had, and she couldn't have been more helpful, calm, and reassuring! She was like the angel I needed in my moments of worry! Many thanks to her!!!!"*

***Elizabeth Millwee,** BSN, RN, CSPI
Certified Specialist in Poison Information

Anonymous response to the MPC Caller Satisfaction Survey in September 2020:

"The agents I spoke with are amazing. Please continue to keep this service for the public. It has been a blessing and a Godsend in those rare cases you need a professional and quickly."

Jill replied to the MPC Caller Satisfaction Survey in November 2020:

"Heather is absolutely AMAZING!! After our initial call, she followed up with us after consulting a toxicologist, and several times throughout the evening. Today, she has followed up with us to check in and monitor us, and we will hear from her again tonight. She has put our mind at ease, and has been truly awesome. We felt extremely comfortable with the level of care and service provided and opted not to go to the emergency room. This allowed us to remain in our home and not a doctor's office or hospital during a pandemic, definitely saved us money on our deductible, and didn't overcrowd an already overwhelmed medical facility with a non-emergency."*

***Heather Sellman,** PharmD
Specialist in Poison Information

Changes Possibly Related to COVID-19 (2019-2020)

- **72%** increase in exposure cases related to hand sanitizers
- **32%** increase in exposure cases related to household cleaners
- **58%** increase in exposure cases related to bleach

Top 5 Causes of Poisoning

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

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:

Public Education During the Pandemic

The COVID-19 pandemic changed the way we educated people in our service area. We already had a consistent social media presence and were able to continue educating people on those platforms. In addition, we added numerous resources to our website. At the beginning of the pandemic, we identified an upward trend in misuse of products such as cleaning products, hand sanitizers, and medicines. We created a Chloroquine and Hydroxychloroquine information sheet, and we updated our hand sanitizer information sheet and wrote a corresponding blog. We also wrote a blog about staying poison safe during the pandemic. A presentation on poison safety during the pandemic was done with multiple agencies in Frederick County. We continue to present public education virtually and update our website and social media with new and trending information.

36 programs (1 ongoing)* in 11 counties attended by 3,502 people

** Frederick County WIC staff attended the 2019 Train-the-Trainer class held by the MPC. They conducted an average of 10-15 poison safety classes per week January through June 2020, reaching 1,800 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**
- **Health insurers**
- **Local health improvement coalitions**

More than 224,000 pieces of educational materials distributed

Below: Pre-pandemic photos.

Social Media and Website

In an attempt to reach more Marylanders with our educational and awareness messages, the MPC continued to routinely update its social media in 2020 on Facebook (@MarylandPoisonCenter) and Twitter (@MDPoisonCtr). Posts often directed followers to information on our website, blog, and YouTube channel.

236 Facebook posts reached more than 107,000 people and generated an increase of 100 followers.

243 tweets lead to more than 208,000 impressions, and a 39% increase in followers.

Approximately 2,000 visitors to our e-Antidote blog, yielding more than 3,800 page views.

Added two new videos on YouTube. Our channel had more than 3,000 views for a total watch time of more than 90 hours.

More than 31,000 people visited the MPC website, yielding approximately 59,000 page views.

Traditional Media

In 2020, the MPC and/or staff appeared in the media at least 26 times. The coverage included web (25) and TV (1). Much of the media generated by the MPC in 2020 was related to use of cleaning products and hand sanitizer during the COVID-19 pandemic.

By the end of 2020,
Facebook had activity from followers in 20 of the 22 counties in our service area

On Facebook
73% of MPC followers are female

On Twitter
there was a 39% increase in MPC followers

Our 18 YouTube videos
were viewed 3,000 times with a total watch time of 90 hours

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 2020, approximately one-fourth 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.

Program Spotlight:

New Virtual MPC Daily Toxicology Case Conference Rounds

In response to the COVID-19 pandemic, all of the MPC's calls were taken by the poison specialists in their homes starting in the first week of March 2020. Our specialists had prepared for this new mandatory telework environment by doing a shift from home roughly once a month since 2011. At the same time, the MPC had to maintain its daily toxicology case conference for all of the learners who normally participate as part of their rotations at the MPC. These include pharmacy, medical, nursing, and paramedic students, as well as pharmacy and medical residents, and fellows of many kinds. Using WebEx, the MPC's Jimmy Leonard, PharmD, DABAT, hosted the rounds virtually.

Various forms of technology were used and evolved with the changing platform. The use of drawing pads and drawing/note taking applications enabled discussion of cases and orienting thoughts. Additionally, when required, slides were used to give structured talks. Most importantly, this allowed participants to login from wherever in the world they were quarantined, whether from the midwestern United States or even Israel and Australia.

In 2020, the MPC continued our partnership with PharmCon, Inc. and provided 20 webinars on www.FreeCE.com, reaching approximately 15,535 health care professionals. Throughout the years, this partnership has proved to be a valuable means of reaching health care providers about the services of poison centers as well as increasing clinical knowledge of the field of toxicology.

6 programs and webinars reached more than 195 health care professionals.

157 health professionals participated in virtual MPC daily case conference rounds in 2020 to learn about the assessment and treatment of poisoned patients.

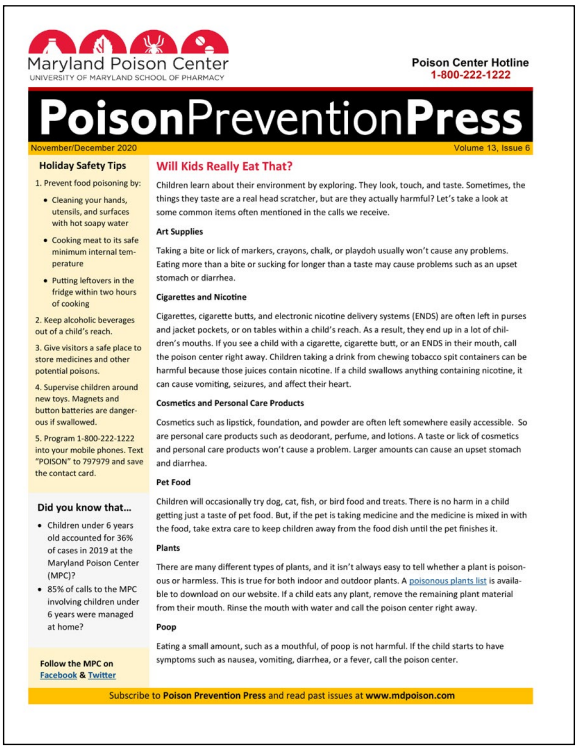
123 tweets lead to more than 97,000 impressions, more than 4,000 engagements, and an increase of 173 followers.

39,551 total cases managed by the MPC

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

Below: Pre-pandemic photo.

Poison Prevention Press and ToxTidbits



Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

Poison Center Hotline
1-800-222-1222

PoisonPreventionPress

November/December 2020 — Volume 13, Issue 6

Holiday Safety Tips

1. Prevent food poisoning by:
   - Cleaning your hands, utensils, and surfaces with hot soapy water
   - Cooking meat to its safe minimum internal temperature
   - Putting leftovers in the fridge within two hours of cooking
2. Keep alcoholic beverages out of a child's reach.
3. Give visitors a safe place to store medicines and other potential poisons.
4. Supervise children around new toys. Magnets and button batteries are dangerous if swallowed.
5. Program 1-800-222-1222 into your mobile phones. Text "POISON" to 797979 and save the contact card.

Did you know that...

- Children under 6 years old accounted for 36% of cases in 2019 at the Maryland Poison Center (MPC)?
- 85% of calls to the MPC involving children under 6 years were managed at home?

Follow the MPC on Facebook & Twitter

Will Kids Really Eat That?

Children learn about their environment by exploring. They look, touch, and taste. Sometimes, the things they taste are a real head scratcher, but are they actually harmful? Let's take a look at some common items often mentioned in the calls we receive.

Art Supplies

Taking a bite or lick of markers, crayons, chalk, or playdoh usually won't cause any problems. Eating more than a bite or sucking for longer than a taste may cause problems such as an upset stomach or diarrhea.

Cigarettes and Nicotine

Cigarettes, cigarette butts, and electronic nicotine delivery systems (ENDS) are often left in purses and jacket pockets, or on tables within a child's reach. As a result, they end up in a lot of children's mouths. If you see a child with a cigarette, cigarette butt, or an ENDS in their mouth, call the poison center right away. Children taking a drink from chewing tobacco spit containers can be harmful because those juices contain nicotine. If a child swallows anything containing nicotine, it can cause vomiting, seizures, and affect their heart.

Cosmetics and Personal Care Products

Cosmetics such as lipstick, foundation, and powder are often left somewhere easily accessible. So are personal care products such as deodorant, perfume, and lotions. A taste or lick of cosmetics and personal care products won't cause a problem. Larger amounts can cause an upset stomach and diarrhea.

Pet Food

Children will occasionally try dog, cat, fish, or bird food and treats. There is no harm in a child getting just a taste of pet food. But, if the pet is taking medicine and the medicine is mixed in with the food, take extra care to keep children away from the food dish until the pet finishes it.

Plants

There are many different types of plants, and it isn't always easy to tell whether a plant is poisonous or harmless. This is true for both indoor and outdoor plants. A poisonous plants list is available to download on our website. If a child eats any plant, remove the remaining plant material from their mouth. Rinse the mouth with water and call the poison center right away.

Poop

Eating a small amount, such as a mouthful, of poop is not harmful. If the child starts to have symptoms such as nausea, vomiting, diarrhea, or a fever, call the poison center.

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

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 2020 include:

- Poison Safety and New Year's Resolutions
- Don't Search…Just Call!
- First-time Parent's Guide to Poison Proofing your Home
- Insect Repellents
- Poison Emergency Preparedness
- Will Kids Really Eat That?

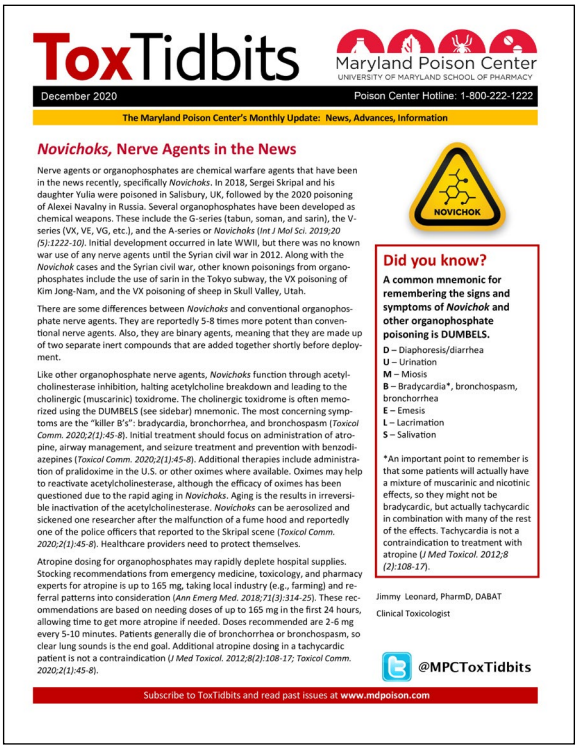
Poison Prevention Press is sent to e-mail subscribers who are encouraged to post and share the newsletter with others. In 2020, the contact list gained 132 new recipients.

ToxTidbits is a monthly newsletter for health professionals containing important toxicology information, updates, and news. Some of the topics addressed in 2020 include:

- What's New with NAC?
- The Nutmeg Challenge
- Methadone and COVID-19
- Oleandrin and Other Cardioactive Steroids
- Milk-alkali Syndrome
- *Novichoks,* Nerve Agents in the News

ToxTidbits is sent to e-mail subscribers and faxed to every emergency department in our service area. In 2020, the contact list gained 143 new recipients.

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



ToxTidbits

Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

December 2020 — Poison Center Hotline: 1-800-222-1222

The Maryland Poison Center's Monthly Update: News, Advances, Information

Novichoks, Nerve Agents in the News

Nerve agents or organophosphates are chemical warfare agents that have been in the news recently, specifically *Novichoks*. In 2018, Sergei Skripal and his daughter Yulia were poisoned in Salisbury, UK, followed by the 2020 poisoning of Alexei Navalny in Russia. Several organophosphates have been developed as chemical weapons. These include the G-series (tabun, soman, and sarin), the V-series (VX, VE, VG, etc.), and the A-series or *Novichoks* (*Int J Mol Sci. 2019;20 (5):1222-10).* Initial development occurred in late WWII, but there was no known war use of any nerve agents until the Syrian civil war in 2012. Along with the *Novichok* cases and the Syrian civil war, other known poisonings from organophosphates include the use of sarin in the Tokyo subway, the VX poisoning of Kim Jong-Nam, and the VX poisoning of sheep in Skull Valley, Utah.

There are some differences between *Novichoks* and conventional organophosphate nerve agents. They are reportedly 5-8 times more potent than conventional nerve agents. Also, they are binary agents, meaning that they are made up of two separate inert compounds that are added together shortly before deployment.

Like other organophosphate nerve agents, *Novichoks* function through acetylcholinesterase inhibition, halting acetylcholine breakdown and leading to the cholinergic (muscarinic) toxidrome. The cholinergic toxidrome is often memorized using the DUMBELS (see sidebar) mnemonic. The most concerning symptoms are the "killer B's": bradycardia, bronchorrhea, and bronchospasm (*Toxicol Comm. 2020;2(1):45-8*). Initial treatment should focus on administration of atropine, airway management, and seizure treatment and prevention with benzodiazepines (*Toxicol Comm. 2020;2(1):45-8*). Additional therapies include administration of pralidoxime in the U.S. or other oximes where available. Oximes may help to reactivate acetylcholinesterase, although the efficacy of oximes has been questioned due to the rapid aging in *Novichoks*. Aging is the results in irreversible inactivation of the acetylcholinesterase. *Novichoks* can be aerosolized and sickened one researcher after the malfunction of a fume hood and reportedly one of the police officers that reported to the Skripal scene (*Toxicol Comm. 2020;2(1):45-8*). Healthcare providers need to protect themselves.

Atropine dosing for organophosphates may rapidly deplete hospital supplies. Stocking recommendations from emergency medicine, toxicology, and pharmacy experts for atropine is up to 165 mg, taking local industry (e.g., farming) and referral patterns into consideration (*Ann Emerg Med. 2018;71(3):314-25*). These recommendations are based on needing doses of up to 165 mg in the first 24 hours, allowing time to get more atropine if needed. Doses recommended are 2-6 mg every 5-10 minutes. Patients generally die of bronchorrhea or bronchospasm, so clear lung sounds is the end goal. Additional atropine dosing in a tachycardic patient is not a contraindication (*J Med Toxicol. 2012;8(2):108-17; Toxicol Comm. 2020;2(1):45-8*).

Did you know?

A common mnemonic for remembering the signs and symptoms of *Novichok* and other organophosphate poisoning is DUMBELS.

D – Diaphoresis/diarrhea
U – Urination
M – Miosis
B – Bradycardia*, bronchospasm, bronchorrhea
E – Emesis
L – Lacrimation
S – Salivation

*An important point to remember is that some patients will actually have a mixture of muscarinic and nicotinic effects, so they might not be bradycardic, but actually tachycardic in combination with many of the rest of the effects. Tachycardia is not a contraindication to treatment with atropine (*J Med Toxicol. 2012;8 (2):108-17*).

Jimmy Leonard, PharmD, DABAT
Clinical Toxicologist

@MPCToxTidbits

Subscribe to ToxTidbits and read past issues at **www.mdpoison.com**

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.

16% increase in ToxTidbits Twitter followers

Research Publications and Presentations

Journals

Leonard JB, Minhaj FS, Klein-Schwartz W. An Analysis of Fatal Iatrogenic Therapeutic Errors Reported to United States Poison Centers. *Journal of Clinical Toxicology.* 2020: 1-8. https://doi.org/10.1080/15563650.2020.1766691

Minhaj FS, Rappaport SH, Gashlin LZ. Predictors for Opioid Adverse Events in Hospitalized Adults. *Journal of Patient Safety.* 2020 Jun 4. doi: 10.1097/PTS.0000000000000735.

Minhaj FS, Anderson BD, King JD, Leonard JB. Outcomes of Acute Exploratory Pediatric Lithium Ingestions. *Journal of Clinical Toxicology.* 2020: 1-5.

Leonard JB, Seung H, Klein-Schwartz W. Impact of a Drug Safety Communication on the Severity of Benzonatate Exposures Reported to Poison Centers. *Pharmacoepidemiology Drug Safety.* 2020 Sep 23. doi: 10.1002/pds.5136.

Leonard JB, McFadden C, Feemster AA, Klein-Schartz W. Analysis of Iatrogenic and In-hospital Medication Errors Reported to United States Poison Centers: A Retrospective Observational Study. *Drugs & Therapy Perspective.* doi: 10.1007/s40267-020-00723-z

Minhaj FS, Leonard JB, Hines EQ. Does Combining Vitamin C to Vitamin B17 Worsen Toxicity? *European Association of Poison Control Centers Congress.* 2020. Clinical Toxicology. 58 (6), 544-544.

Minhaj FS, Rappaport SH, Gashlin LZ. Predictors of Serious Opioid-related Adverse Drug Events (ORADE) in Hospitalized Adults. *American College of Medical Toxicology 2020 Annual Scientific Meeting Abstracts* – New York, NY. Journal of Medical Toxicology. 16, 116–168 (2020).

Schuetz, E. Electronic Cigarette and Vaping-Associated Lung Injury: Basic Information for Nurses, *Journal of Radiology Nursing, 2020.* DOI: 10.1016/j.jradnu.2020.11.002.

Posters

Minhaj FS, Leonard JB, Klein-Schwartz W. Evaluation of Perampanel Exposures Reported to the National Poison Data System (abstract). North American Congress of Clinical Toxicology. Virtual meeting, 2020.

Minhaj FS, Leonard JB. What is the Clinical Course of Severe Benzonatate Poisonings? (abstract). North American Congress of Clinical Toxicology. Virtual meeting, 2020.

Leonard JB, Minhaj FS, Ferrell A, King JD. A Retrospective Study of Dialysis in Poisoning: What, When, and for How Long (abstract). North American Congress of Clinical Toxicology. Virtual meeting, 2020.

Ryan E, Leonard JB. An Assessment of the Severity of Copperhead Bites Based on Extremity (abstract). North American Congress of Clinical Toxicology. Virtual meeting, 2020.

Minhaj FS, Leonard JB. Evaluation of Level of Care for Toxic Alcohol Ingestions Receiving Fomepizole: A Case Series. ACCP Annual Meeting. 2020.

Minhaj FS, Klein-Schwartz W, Leonard JB. Clinical Effects of Acute Warfarin Overdose. ACCP Annual Meeting 2020.

Minhaj FS, Hines EQ, Klein-Schwartz W. Should We be Concerned about Pediatric Accidental Chloroquine and Hydroxychloroquine Ingestions? North American Congress of Clinical Toxicology. 2020.

Minhaj FS, Leonard JB, Klein-Schwartz W. Clinical Outcomes of Perampanel Toxicity. North American Congress of Clinical Toxicology. 2020.

Minhaj FS, Rappaport SH, Gashlin LZ. Predictors of Serious Opioid-related Adverse Drug Events (ORADE) in Hospitalized Adults. American College of Medical Toxicology 2020 Annual Scientific Meeting Abstracts – New York, NY.

Presentations

Faisal Minhaj, PharmD
Pediatric Computed Tomography (CT) Scans and Subsequent Cancer Risk. North American Congress of Clinical Toxicology. September 2020.

Emily Paterson, BS, CHES®
Tools for Distance Education. North American Congress of Clinical Toxicology. Virtual. September 12, 2020

Emily Paterson, BS, CHES®
COVID-19 Impacts and New Ways of Working - Panel Discussion; Johnson & Johnson Consumer Inc. Virtual. Sept. 30, 2020

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