

Erin Welsh: Hi, I'm Erin Welsh.

Erin Allmann Updyke: And I'm Erin Allmann Updyke.

Erin Welsh: And this is This Podcast Will Kill You.

Erin Allmann Updyke: And we're obviously doing things weird because why are you hearing from us straight away?

Erin Welsh: That really felt weird. I was like but there's no firsthand account. So I just... Like how do we begin?

Erin Allmann Updyke: Ease into this, no? We eased in last week.

Erin Welsh: Yeah. Yeah, we did.

Erin Allmann Updyke: Last week. Did you listen? If you haven't heard last week's episode, I'm not saying you must pause this and go check it out but you probably should because we had so much fun talking and learning about what is poison control and how did poison centers come to be. Where did they arise from and how did we even figure out that that needed to happen?

Erin Welsh: Yeah.

Erin Allmann Updyke: It's a great episode. Definitely check it out. And so today we're picking up essentially where that left off.

Erin Welsh: Right. So we learned all about how they came to be but we didn't learn what they do, how they work, who works there. All of these questions that are really kind of integral to the existence of poison control centers today.

Erin Allmann Updyke: Right.

Erin Welsh: And so that is what we're getting into this week. And we are getting into that with the help of an actual super duper expert, Dr. Suzanne Doyon, who is the Medical Director of the Connecticut Poison Control Center and is an Associate Professor at the University of Connecticut School of Medicine. And she's a toxicologist. I mean like honestly this conversation was so much fun. She knows everything about... All the stories. Incredible.

Erin Allmann Updyke: This is why we don't need another first hand account because she's got so many stories for us. It's phenomenal. She sat down with us to answer all of our burning questions about what it is like on the other end of that phone line, when we call in to poison control.

Erin Welsh: Yeah.

Erin Allmann Updyke: What it took to become a medical director of a poison center; what it takes to be a poison specialist. By the way, best job title I've ever heard of. And there's so much more in this interview. We are thrilled to be able to have had this conversation and to share it with all of you. It's going to be a really great episode. We're stoked.

Erin Welsh: It really is. But before we get into all of that, it is quarantini time.

Erin Allmann Updyke: It still is. It still is. The same drink as last week. It's just that good, Name Your Poison.

Erin Welsh: Yeah. I mean and if you want to stick with last week's recipe, it is whiskey, again of whatever kind, probably not a peated scotch, blah, blah, blah, whatever. Do a whiskey and then peaches, lemon juice, simple syrup. It's delicious. But hey, it's called Name Your Poison. If you're like you know what, I'm going to do a variation on this, I'm going to do something else, I'm going to do nectarine instead of peaches.

Erin Allmann Updyke: Wow. Go wild, okay?

Erin Welsh: Go wild. Go absolutely wild.

Erin Allmann Updyke: All that's to say the recipe is on our website, it's on our social media. Do you follow us on social media? We're on TikTok, we're on Instagram, we're on Twitter X. Is that what they're calling it these days?

Erin Welsh: I'm not sure.

Erin Allmann Updyke: I think it's like Prince, the artist formerly known as. So it's like X formerly known as Twitter is the official...

Erin Welsh: The website formerly known as Twitter. Yeah.

Erin Allmann Updyke: Anyways, we're there.

Erin Welsh: We're there. Erin, do peach pits contain cyanide?

Erin Allmann Updyke: Great question.

Erin Welsh: Because I just had that realization after we-

Erin Allmann Updyke: Great question. I don't know.

Erin Welsh: Okay, we just confirmed via the search engine that we all use that yes indeed, peach pits contain, well, a compound that gets turned into cyanide when digested. And we didn't realize this. I mean we should probably have just like delete all this in editing and then claim that we knew it from the beginning.

Erin Allmann Updyke: Right. Rerecord our other intro.

Erin Welsh: Yeah.

Erin Allmann Updyke: It's too late now.

Erin Welsh: Yeah. Anyway, yeah, we totally did this intentionally?

Erin Allmann Updyke: Enjoy your drink.

Erin Welsh: Enjoy your drink. Back to the other stuff. Website.

Erin Allmann Updyke: Website.

Erin Welsh

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Erin Allmann Updyke

Things.

Erin Welsh

Can we get into the episode?

Erin Allmann Updyke

Let's take a quick break and then we'll get to hear from Dr. Suzanne Doyon herself.

Erin Welsh

Let's do it.

TPWKY

(transition theme)

Erin Allmann Updyke

We are thrilled to have you here, Dr Doyon. Thank you so much for joining us. If we could start off with you introducing yourself a little bit and telling us how you became interested in the field of toxicology and how you ended up as the medical director of a poison control center.

Suzanne Doyon

Thank you and thank you for having me. This is just for me a wonderful opportunity to share a little bit about the world of poison centers. So my name is Suzanne Doyon and I'm a physician. I went through medical school but after finishing medical school, emergency medicine was where I was headed. And so I did a residency in emergency medicine. And during those four years as an emergency physician, you rotate to a number of different places, you do a little bit of pediatric work, you do this, that, and the other. One of the rotations was a whole month at the New York City Poison Center. And I just really, really enjoyed that work. So upon finishing my four years, I chose to do what they called a fellowship. So that was my entire training. Four years of medical school, four years of emergency medicine, and two years of medical toxicology.

What was it about the specialty that attracted you, right? And so of course poisonings are very, very interesting but really it's the opportunity to really dig deep into a subject matter, to have an expertise. And to honestly bring that expertise to the bedside, to physicians with a little bit less expertise and guide them through the process. Because I always found emergency medicine to be more of a horizontal specialty. You know a little bit about a lot of different topics. This was an opportunity to know a lot about one small topic. And that really attracted me. Now following that, you asked me how did I become a medical director of a poison center? So once you do all this training, you have a couple of avenues. You can go in the industry, you can do a number of things. But the two big avenues are are you going to be in a hospital where you consult at the bedside and see poisoned patients at the bedside? And you're responsible for that one patient in front of you and make decisions accordingly.

The other avenue, which is the avenue I chose, is to go more into a bit of a more of a public health around so to speak. You become medical director of a poison center. And then yes, you are to some degree involved with the management or the care of a patient at a bedside because you will be on call for the poison center. But also as a medical director, you will make more population-based decisions. You will build the kind of decision trees, you will have to make big decisions on this antidote for my patient, my entire state patient population vs this antidote. How we're gonna kind of a deal with this? And I found that to be very, very impactful because again the decisions you make impact the population of your state. So that's millions of people usually.

And then as I said, we're on call. What does that mean? So when poisoning is that severe, we have physicians on call 24/7, 365. So occasionally that's me. But I parachute in and talk to the physician at the bedside. So the physician at bedside sees whatever it is that they see, whatever poisoning that they're seeing, they give me the details, we go back and forth with questions to try to kind of get the story straight. I help with the diagnostic testing and any therapy that is administered at the bedside. So just to give you an idea, cyanide poisonings don't occur very often. A given poison center of my size, Connecticut is about 3.5 million people, we'll get about one cyanide overdose per year. So there's no single physician in a hospital out there that has a lot of experience with cyanide overdose. It just doesn't exist. But I get to see about one a year. It's not a whole heck of a lot but I get to see one a year. So after 10 years I've seen about ten or so roughly.

And so there are antidotes for cyanide poisoning but often the physicians I'm speaking to have never given the antidote before. They're just like I'm a little bit uncomfortable here. I've never given this before. And I'm like that's okay, I'll stay on the phone with you. Just stick me on hold. I will not disappear from the phone. Administer it, if you run into any problems, I'm right there and we can kind of navigate whatever difficulties you're having. Now in reality the cyanide antidote is pretty easy to administer, it's pretty safe. But still it's addressing that comfort or that lack of comfort. And so sometimes we stay on the phone, we really do stay on the phone with the physician and a critically ill patient to really help them at the bedside. So I find that very rewarding as well. It's not population-based medicine, it's case by case medicine but it's very rewarding.

Erin Welsh

Of course you get an incredibly diverse array of phone calls at a poison control center every single day. And I was hoping you could take us through sort of this decision tree for what happens when you get a phone call. What are the first steps? What are the questions asked? What sort of paths can you follow down afterwards?

Suzanne Doyon

So first of all let's talk about the phone and the phone system. We are not like 911, our phone number is a 1-800 number. It's quaint. We're working, we would love legislation to have a three digit number. But getting Congress to agree is a little bit difficult at times. But that 1-800 number; no matter where dialed from, a landline, cellphone, doesn't matter; will be answered 24/7, 365. And I want to specify here, not by AI, not by artificial intelligence, a person will answer it. On occasion there's wait times but we, we really strive to keep our wait times extremely short. So that 1-800 number available 24 hours a day, we never, ever, ever not answer the phone.

What's gonna happen? So you're gonna get a person who's gonna first ask sort of what's the emergency? Is this really, really something extra emergent or is this something I can take my time and get the patient's name and so on and so forth? But they will ask you your name or the name of the child if it's a parent calling. They will ask the age of the person. They will often ask gender as well. And then what happened? What's the scenario? Was it ingested? Is this more of a dermal exposure that we're worried about? Is it an ocular exposure that we're worried about? Is it an injection exposure that we're worried about? Is this an acute exposure? Just happened one time right now, it just happened. Or is this something that was every day for the last month or so or something like that? Is this an accidental exposure or is this something intentional?

And ultimately, what is this substance? Is it a drug? Is it a chemical that we find in the household? Is it a snakebite? Is it a spider bite? Is it something that was breathed in? Is it some kind of smell or some kind of smoke or some kind of gas in your neighborhood? So then once all this information is collected, often the poison, they're called poison specialists, the poison specialist right off the top of their head knows what the ingredients are, knows what are the potential pitfalls, and will make recommendations. So the the recommendations will vary from stay at home and you don't need to worry about it too, too much, to you need emergent, immediate medical help.

How they make these decisions is based on their intrinsic sort of internalized knowledge of things. And then I create for them 100-200 different complicated algorithms that they can follow as well. The algorithms are available for them 24/7 and it's on a computer platform. And over time though they'll be internalized. Again, a lot of these algorithms, you use the same algorithm every day for a week, you've internalized it usually. So that's what happens when they call the poison center.

Erin Allmann Updyke

I love it. Having called the poison center several times. It's just always a phenomenal experience, if that is a thing that you can say about an emergency situation.

Suzanne Doyon

Well I'm happy to hear this. We strive to be nice and polite on the phone but we mostly strive to be helpful. Collectively in the United States, every poison center feels the same way. If we're not helpful, we have failed terribly at our jobs.

Erin Welsh

Let's take a quick break.

TPWKY

(transition theme)

Erin Allmann Updyke

So speaking of that, of your staff and everyone that you have at your poison center, who are the people, the poison specialists who work at the poison center? What kind of training does someone need to have to be able to be a poison center phone operator?

Suzanne Doyon

So who are the people answering the phones? They are not operators, they're not volunteers. They're paid. They are usually of two trainings. They are pharmacists or nurses. If they're pharmacists, usually they're licensed in that state and nurses are licensed as well. If they're nurses, they usually have one or two years of critical care experience or something like that. And that's to qualify for the job. Now once they qualify for the job, there's usually about one year of solid training that goes on where they are supervised in real time. We listen to their calls to supervise and make sure that they do the job correctly. And as they get better and better at their jobs, of course then we don't listen to every single call. A lot, a lot of one on one teaching hours and hours and hours of didactic training. All this culminating into a certification exam.

Once they become certified, they can really fly solo on the phones. If the case is very, very serious, they will then immediately call the physician on call. The physician on call is someone like me, someone with medical toxicology training. We can sometimes just speak to the poison specialist to give them some guidance but sometimes this is just plain so serious we must speak to the ED physician, to the intensive care physician, whoever is at the bedside of the patient to help with what's going on. So yesterday I was on call, sometimes the patient had been in the ED... The patient was stable, completely stable. But they had done all the labs and the labs had been reported back to the poison specialist. And it is at that point that the poison specialist called me to review the labs to see if, based on the labs, it was safe to send the patient home from the ED and not admit the patient.

So sometimes the questions are those. How can we safely take care of this patient? And so on so forth. And think about that, that saves an admission, yes, it saves healthcare resources. But think about the patient. The patient is not facing an admission, the patient's family doesn't have to drive back and forth to the hospital to visit the patient. The patient doesn't get pricked for blood work and so on so forth, the patient gets to sleep at home. All these things are good, good things for the patient, for the system in general. So we try as much as possible to keep the patients away from the hospital if we can. So this was a good use of poison centers in terms of saving healthcare resources and doing right by the patient.

Erin Welsh

The POISINDEX. What can you tell us about the POSINDEX?

Suzanne Doyon

So POSINDEX is how some people call it, other people call it Micromedex. We use the terms interchangeably. But what is this? What is this mammoth that it is? So I will tell you the poison specialists are probably in Micromedex every minute of every shift. But what is it? It's an online database, there's an internet and there's an intranet version. But it's a huge, huge, huge database. You just put, for example, Mr. Clean, whatever, some kind of cleaner you use in the household. But you put the brand name and it will start outlining the ingredients for you. But you say you can get that from the label. So why do we have Micromedex? Because then Micromedex classifies the different individual ingredients into kind of categories or buckets, so to speak. And that helps us kind of understand the product much, much, much, much better.

So let me give you an example. Let's say this cleaning agent used in the household has benzyl ammonium chloride. We in poison centers all know what that is. But you don't or let's say you're a new poison specialist, you don't know what that is. Micromedex or POSINDEX is gonna classify benzyl ammonium chloride into cationic detergents. Now the poison specialist should know cationic detergents, of all the detergents out there, those are the ones I need to worry about. So there starts the process. And in cationic detergents, it's only concentrations of the detergents above 7.5% or so that we worry about. So the next step, once the poison specialist recognizes it's a cationic detergent, is go back, what percentage is this? 2%? 3%? 5%? 17%? What is this? And then take it from there. So it's a combination of knowing how to use a database but that's what Micromedex does.

You need to be able to read labels as well. So we're very fortunate in the United States that we have very strong labeling laws, they date back to the 1960s. And so they will list the active ingredients and they will list the inactive ingredients. And then when you see that list of active or inactive ingredients, it doesn't matter. The most concentrated one will appear first, not the most toxic one, the most concentrated one will appear first. And then the least concentrated ones will appear less. And usually if the concentration is less than 1%, they're not mandated to put it on the label at all. Those are the basic, basic rules. So that again, if you know these rules, you could start decoding a little bit these labels that we have on all the products out there. But that's what we do with Micromedex, that's what we do with labels. Using brand names, it helps us kind of drill down to what the ingredients are and what the toxicities are.

Erin Allmann Updyke

So how do you analyze the risks of ingestion or exposure when there are multiple substances? Either the example that you gave of like a cleaning product that has this long list of ingredients or someone who either intentionally or accidentally took a mixture of different medications. Like how do you, I assume with the assistance of Micromedex, prioritize these ingredients? And what other data do you need to be able to work through that problem?

Suzanne Doyon

So I think we probably encounter that honestly a little bit more when people ingest different medications. And these are called drug drug interactions and they're getting a lot more common than they used to be. There are not that many honestly computer programs that help you with it. So what it is is honestly just having a basic knowledge of what gets metabolized what way and what medications can interfere with that metabolism. So that's a pharmacokinetic. Or just knowing intrinsically that for example a medication gets primarily eliminated by the kidneys. And then just hearing that either another medication is added or just hearing that the patient's kidney function, the patient's renal function is a little bit off. So having a little bit of knowledge of these kinetics is important. So we have to teach the poison specialists. We really kind of just have to teach and teach and teach them.

Then we have the other drug-drug interactions that we call pharmacodynamic. So a drug binds to a receptor and another drug is added that binds to the exact same receptor. That's basically bottom line knowing how every drug out there works. And we carry that knowledge, we just have that knowledge, we teach it. And so we can often, often just right off the top of our head say that mix of that drug with that drug is just not gonna be a good mix because they target the same receptor and that's gonna be a bit of a problem. We're gonna have too much of an effect or not enough an effect depending on whether they're agonists and antagonists and so on and so forth. When we're talking about all the different chemicals in household cleaners, for example, the cleaners are all there to kind of clean. So they all have kind of... They're all there to aim for one given thing. And the active ingredient is the active ingredient for the purpose of that product.

So for example, an insecticide, you look at the active ingredient. The active ingredient is the ingredient to kill insects. And so is that gonna be an active ingredient in the human? Maybe, maybe not. Right? So a lot of insecticides these days contain what we call pyrethrins. Pyrethrins kill insects but they're not particularly problematic in humans. So we're not gonna worry too much with the insecticides or at least the active ingredients. Then we're gonna start looking at all the other things they added there, things to make it more liquid, things to make it smell, god knows what smell they're searching for. Things to make it maybe a bit oily. So when you spray it on your plants, because it's oily, it stays on the leaves. All these things we're gonna look at and see if it's particularly problematic for humans. And then so if the patient ingested the insecticide but also then ingested turpentine, so then does the turpentine interact with the insecticide? So that's just a lot of thinking, a lot of thinking. But again, we navigate that and again try to figure out how to best help the patient at that point in time.

Erin Welsh

Let's take another quick break.

TPWKY

(transition theme)

Erin Welsh

You mentioned how some of the calls that you're getting more of these days involve interactions between different medications as people are going on more medications. Have you noticed any other trends in what calls you're getting more or what types of calls you're getting more today compared to calls in the past or even just like in the overall number of calls that you're getting?

Suzanne Doyon

Absolutely. So we keep abreast of these trends. And so you're gonna hear a whole host of things as just the population shifts in what it is that they purchase, what it is that they have in the home, what children have access to. So you're gonna hear a lot of noise right now about melatonin, for example. So the melatonin products have been largely manufactured into gummies. They look like little candies. Some of them are actually shaped like little teddy bears. But they certainly have very beautiful colors, they look like candy. So not surprisingly, even though they are provided in big jars with child resistant caps, children are just either breaking through the child resistant cap or some way, shape, or form getting into the gummies. And so there's a lot of melatonin gummies.

So on the issue of gummies, marijuana gummies, lots of those around. So the states that have legalized marijuana, adult use marijuana, will have usually a component of their marijuana products that are what we call the edibles and the edibles can be all kinds of different confections. And so some states have been very strict on this. Connecticut has been very strict on this. Our edibles must have kind of uninteresting square shapes. They can't have any interesting colors, they're kind of bland really. They must be in child resistant containers. A given edible cannot contain more than 5 mg per edible, 5 mg of THC, the delta-5 THC, the active ingredient in marijuana. And you cannot have more than 100 mg in a bottle. So that if the child gets into the entire bottle, it's still a large amount of 5-THC for the child but we're not talking thousands of milligrams, we're talking 100 mg. And so gummies, you're gonna hear a lot about gummies as being a problem.

The changes in abortion laws are recent. So we haven't quite, quite studied yet or produced the data yet but we expect an increase in use of herbals, dietary supplements to terminate a pregnancy in women who have very few other options. I can't say that we've seen but we're watching this, we're watching this right now, we're surveilling this. We've definitely seen an uptake in the GLP-1 receptor agonist, the Ozempic, Wegovy, there are a couple of others out there, injectables that are used for the management of diabetes. But more recently for weight reduction. And we see all kinds of behavior with that, from wellness spas that are dispensing Ozempic.

We've also had people who, if one dose of a epic is good to lose weight, then doubling the dose is probably better. You have to be very careful with these products. The escalation of the dose is very, very slow. So if you escalate the dose too quickly, you run into adverse effects and they get a lot of nausea and vomiting and it lasts for days and days and days. It's a gastroparesis type of of nausea or vomiting. So problematic. Back to the Ozempic dispensed from non retail pharmacies. One such product was analyzed, it contained insulin. It did not contain any semaglutide, which is the ingredient in Ozempic. it contained insulin. So the wellness spa sent non diabetic patients who were looking to lose weight, they sent them home with syringes of insulin.

Of course the opioid epidemic, we're seeing a lot, a lot of that. The opioid epidemic right now is really a fentanyl epidemic. That is our major, major issue in the United States is the fentanyl, its potency. Everybody is kind of hot under the collar about xylazine but it's really the fentanyl that is the problem. And we're not out of it but most of us don't predict we're going to be out of it for a good 10 years. It's going to take time to change the tide on that big, big epidemic. So I would say those are the big, big trends we're seeing right now. But of course that will change in six months.

Erin Welsh

What do you find to be the most rewarding aspect of this work that you do?

Suzanne Doyon

I think that the times I go yay! Right? Usually the appropriate use of an antidote. Appropriate meaning we thought the problem was right, we aim to solve the problem with an antidote, and then the patient did well. A cyanide overdose that gets the appropriate antidote turns the corner and survives, because cyanide is quite toxic, is just a cause for celebration. But they come in all shapes and forms. I remember this, it was way, way back but funny story, the child was bitten by a copperhead. Had a pretty significant wound to the hand and was seen in a hospital that could not admit pediatrics. So this child went from this peripheral hospital by helicopter to a what we call tertiary care pediatric center and got the antidote in the meantime. Did very, very well, they recovered. I think he was seven or eight. And kind of left the hospital.

And so think about this. He was out there, got bitten by a snake, got an antidote, helicopter ride to the city, all this stuff. He goes I have got a story for show and tell, I've just got the best story. So that was just like yeah, you probably do. And that was just... It still brings a smile to my face, just really, really funny. Those are yay moments for us in poison center circles. But it's usually saving a life, getting the antidote right, getting it in quickly, and the patient turns the corner. And any physician will tell you that that's just... You feel like 1000 bucks or a million bucks. You really, really feel like you're a superstar at that point in time. And it's so great to turn to the family and say yeah, he's gonna do okay. So those are our great saves and our great, great moments. They're few and far between but they're great.

TPWKY

(transition theme)

Erin Welsh

That was such an amazing conversation. Erin, we could have talked all day.

Erin Allmann Updyke

I was just going to say, I could have sat there for so many more hours just like picking her brain and asking for stories. And yeah.

Erin Welsh

I know, I know.

Erin Allmann Updyke

I would love to sit for a day in a poison center as well just to hear it and experience it.

Erin Welsh

Yeah. Well and it's also I think what's really amazing to me is that this is a hugely impactful area of public health that I didn't really ever think that much about or know that much about or know was an option. And I just think it's really amazing to know that okay, let's say that you go into the field of medicine and you're like I want something that has one foot in public health and one foot in medicine. This is a great opportunity for that. Or if you're just like hey, you know what, I want to keep in my brain an absolute database of compounds and what organ metabolizes them and what receptor they use and blah, blah, blah. Like it's so cool.

Erin Allmann Updyke

Yeah. Also Erin, I agree 100% that this is like, especially coming from the field of public health, not realizing how amazing and impactful poison control is. That's what we're about to get into.

Erin Welsh

Yes!

Erin Allmann Updyke

Is like what poison control can do for you. What it's already doing that you didn't even know about. I will say that we're going to focus on the US and this has been a very US centric episode but we're also going to get into just how much the US doesn't focus enough on poison control, hint, hint, funding-wise. And I will get a little bit into the global status of poison control centers worldwide. Spoiler, there's never enough of them but they do exist.

Erin Welsh

Nope.

Erin Allmann Updyke

And yeah. Because there's so much there, Erin. I can't wait to get into it. So currently as of 2024, there are 55 poison control centers which have recently rebranded into Poison Help Center.

Erin Welsh

Okay.

Erin Allmann Updyke

I think is what they're calling themselves. So not every state has their own poison control center but every state in the US is served by at least one poison control as are all US territories. But here is a thing that I... Again, thinking back to how this started, I just love this about the poison control centers in the US is that all 55 of these use a centralized reporting system which is called the National Poison Data System. And we heard a little bit about this and the information system that they used in our interview. But this reporting system is the National Poison Data System or the NPDS. This uploads real time data of every single call that is made to all of these poison control centers. This generates so much data that we can use to understand the impact of poison control centers and be able to actively in real time see trends, like we talked about in our interview, on what are people calling poison control center about? Surprise, surprise, it's Ozempic these days. Right?

Erin Welsh

Yeah.

Erin Allmann Updyke

And so from this, we also get these incredible annual reports. The most recent annual report that came out was from 2022 that was released in January of this year and it happened to be the 40th NPDS report, so happy anniversary. And so this gives us some pretty solid statistics on how many people are calling and for what reasons. So in 2022 in the US, there were over 2.4 million encounters logged. Of these, over 2 million of them, 2,064,875 were human exposures, 50,000 of them were animal exposures, and 360,000 of them were information requests, which means people contacted poison control even though there wasn't an actual exposure.

Erin Welsh

Okay.

Erin Allmann Updyke

And we can see what the top substances were that people called about or that people were exposed to. And these interestingly, like the top four main categories haven't changed a ton over the years. And what's interesting is that in this report, because it was the 40th, they had a data table that was compared to 1983 when this started and 2022. What are the differences? And there are definitely some but top of the list for exposures is analgesics. And that is things like acetaminophen or Tylenol and Ibuprofen which account for 11% of all calls.

Erin Welsh

Okay.

Erin Allmann Updyke

Next on the list is household cleaning substances followed by antidepressants and then cosmetics or personal care products, which is also interesting. Now who is calling in? We get that information as well. Unsurprisingly unfortunately, kids under five account for the majority of exposures, like kind of overall. So kids under age three accounted for 28% of all exposure calls and kids under five accounted for 40% of all human exposures.

Erin Welsh

Okay.

Erin Allmann Updyke

And they are actually more likely to be exposed to cleaning products over analgesics, which is like we talked about because they're easily accessible and a lot of times we might not think about them having as kid proof of access like a lot of our medications do these days.

Erin Welsh

Right.

Erin Allmann Updyke

All told, all of these over 2 million exposures resulted in 3255 cases of death, 2622 of which were judged as directly related to the exposure. And what I found really interesting is that out of all of these poison control calls, whenever there is a death that's reported, there's a really complex review process where they go back to that data to try and determine how likely it is that the exposure was related to the death, if that makes sense.

Erin Welsh	Okay. Interesting, yeah.
Erin Allmann Updyke	So that was like a lot of data thrown at us. And there was a really interesting Radiolab episode that I listened to.
Erin Welsh	Yes.
Erin Allmann Updyke	You listened to it too.
Erin Welsh	I did too. Yeah, it was so good.
Erin Allmann Updyke	It's really great. Their production value can't be matched. But one of the things that they mentioned in that episode is that calls have been on the decline to poison control centers. And it's in this report as well too. Calls have been on the decline. There have been a fairly continuous decline in total calls to poison control centers since about 2008, which is when it peaked. When it peaked there were just over 4.3 million calls to poison control centers in 2008 which included 2.4 million exposure calls, human exposure calls, and 1.7 million information calls. There was some spikes during the pandemic, especially related to disinfectant use and then COVID vaccines and things like that, which is probably interesting in its own right. Very interesting. But I'm not going to get into the detail. But what I think is so interesting about these trends specifically are a few important details that are even bigger picture than just a decline in calls. What this decline in calls seems to reflect is a number of different things. The report from 2022 cites that there has been overall declining birth rates, which is important because exposure rates are so much higher in children under age five.
Erin Welsh	Interesting.
Erin Allmann Updyke	And an increasing reliance on the internet. Because a huge part of what I just said, 1.7 million calls were information only calls compared to 360,000 information calls in 2022. So when someone is looking for just information about a substance without a direct exposure, they're going to go to the internet first. And that makes a lot of sense.
Erin Welsh	Yeah.
Erin Allmann Updyke	Now as of 2015, poisonhelp.org can actually get you really similar information to what you're going to get from a poison control call. Because you can get in touch with poison control via their website poisonhelp.org as of 2015. So some of these cases might still make it into the poison control database if they're coming from that website, if that makes sense.
Erin Welsh	Yeah.
Erin Allmann Updyke	But what we can't necessarily interpret from this reduction in calls is that exposures are decreasing. Because what this data from 2022 shows is that exposures with more serious outcomes, including hospital facility calls and calls that result in major harm or death, have actually been on a slight increase across the same time period.
Erin Welsh	Okay. What are the characteristics of these calls? Are there patterns in this?

Erin Allmann Updyke

Not necessarily patterns aside from just that they're more serious calls that have a more serious outcome. Whereas information only calls and calls about less serious exposures have been on the decline around the same period. And it's not a huge increase, I think it was like 0.17% from last year, for example. And that's about on average. I think it's like 1% ish over the years. But it is really important, right, that people are still having dangerous exposures and still relying on poison control to call, either from their home or healthcare facilities are relying on calling poison control for information. And so this is a really important thing that poison control centers are kind of grappling with is how to bring themselves into the 21st century, which is really important. Because we can look at lots of data and see how important poison controls are in terms of lives saved and in terms of healthcare dollars saved, Erin.

Erin Welsh

Uh-huh.

Erin Allmann Updyke

Which I love to talk about. We don't like to think about healthcare dollars but we talk about them on this podcast a lot because, especially in the world of public health, you have to unfortunately justify your existence using dollar signs. And it happens that in the case of poison control we can absolutely do that. There was a ton of different studies that I saw but I'm actually going to cite a few that were really old just because they highlighted this point so well. There was a paper from 1991 when the State of Louisiana closed their poison control center. And then they were able to compare after this closure in Louisiana information between Louisiana and Alabama, which is right next door, has very similar demographics, and prior to the closure of the Louisiana Poison Control Center had very similar, almost identical triage patterns for exposures of their poison control center. So when they looked at the data, it was really, really similar calls that were coming in.

Erin Welsh

Okay.

Erin Allmann Updyke

And what they found is that the rates of people who had to end up going to the emergency room or urgent care or the doctor's office in Louisiana after the closure of this poison control center, four times as many people sought care for poison exposures in Louisiana compared to Alabama during that time.

Erin Welsh

Wow.

Erin Allmann Updyke

And the estimated cost of this hospital and outpatient utilization for things that, these are low level exposures that did not need to be managed by healthcare facilities at all, was \$1.4 million.

Erin Welsh

Oh my gosh.

Erin Allmann Updyke

And you might say well that's not that much money when you look at huge health care spending overall. But it was also three times as much as the poison control center cost to run in its entirety.

Erin Welsh

Oh my gosh. Okay. So I have a question though, just like logistically. When you call poison control, it's 800-222-1222.

Erin Allmann Updyke

That's the number.

Erin Welsh

So when Louisiana shut down its poison control, what did that mean if you were in the State of Louisiana and you called that number?

Erin Allmann Updyke

That is such a good question. I don't know what happened in 1991.

Erin Welsh	Okay. 1991. So things might have been organizationally different.
Erin Allmann Updyke	So I don't know if they just lost access entirely. I know that they had enough data to be able to say there's no access here, let's compare and see what happens.
Erin Welsh	Yeah.
Erin Allmann Updyke	Because right now when a poison control center shuts down, and we'll get there, then calls are going to be rerouted. But it could end up then overwhelming another poison control center if you don't have enough people to kind of run it and that sort of a thing.
Erin Welsh	Okay.
Erin Allmann Updyke	But yeah.
Erin Welsh	Another question. Follow up question.
Erin Allmann Updyke	Give it to me.
Erin Welsh	After this report came out, did Louisiana immediately go oh wow, whoops?
Erin Allmann Updyke	I don't know the time frame but there is one now.
Erin Welsh	Okay.
Erin Allmann Updyke	I know.
Erin Welsh	Hopefully it was 1992 or like whenever.
Erin Allmann Updyke	1993, I don't know. But there are a lot of other things that go into how much poison control centers can help, right. There are a lot of other examples like this. There's also some really good ones. There's a paper that details how in El Paso when they coordinated really well with a poison control center, they have documented that they were able to avert like 1700 ambulance calls in a really short time period.
Erin Welsh	Whoa.
Erin Allmann Updyke	There's a review paper from 2009, and a lot of these papers were really quite old, but it had a lot more numbers. And that combined with a report that I will say was commissioned by the American Association of Poison Control Centers, so there was some bias for that because it was a consulting firm commissioned by Poison Control. But looking at all of this data, the overall cost savings estimate of poison control centers is between \$7-\$15 per dollar spent.
Erin Welsh	Whoa.

Erin Allmann Updyke Which accounts for close to a billion dollars in health care savings annually. And that's not even counting how many lives are saved. Because there are a lot. Like there is a lot of data that shows that you can reduce hospital length of stay and you can improve health outcomes by having access to Poison Control Center. Despite this, budgets are constantly at risk for poison control centers in the US.

Erin Welsh It's the same story for public health in general and it is infuriating.

Erin Allmann Updyke It is the most infuriating and just the tale as old as time honestly.

Erin Welsh Yeah.

Erin Allmann Updyke Most of the funding for poison control centers is a mish mash cobbled together budget, right. Some of the funding comes from state budgets, some comes from federal budgets. There's over 29 different agencies which contribute to various poison control centers. And I said that there were 55 poison control centers in the US.

Erin Welsh Yeah.

Erin Allmann Updyke If you read some of these papers, they'll tell you that there are 61 because there used to be. But in the last few years, several of them have closed due to budget cuts. The poison control centers in the US are so vulnerable it is bananas. When you look at the data of how much they contribute, how many dollars they save, how much data we are able to generate from this real time reporting system. Like the value that they bring is incredible. So that's our rant. I don't know how to fix that but it's a thing.

Erin Welsh I mean invest in public health.

Erin Allmann Updyke Yep.

Erin Welsh Yep.

Erin Allmann Updyke Now globally, speaking of investing in public health, as of January 2023 only 47% of World Health Organization member states have poison control centers. So it's a pretty low number. Most of the countries in Europe, Australia, the UK, they all have poison control centers but especially in low and middle income countries, there's a lot of parts of the world where people just don't have access to this information which is a huge issue.

Erin Welsh Right. Well and I think it just sort of shows in general that pattern where it's expensive to invest initially in poison control centers but over the long run, it saves money.

Erin Allmann Updyke Exactly.

Erin Welsh But if you don't have that initial investment and it's more like okay well just triaging-

Erin Allmann Updyke Right.

Erin Welsh The healthcare situation-

Erin Allmann Updyke Yeah.

Erin Welsh: The preventative stuff is like down the line.

Erin Allmann Updyke: Right.

Erin Welsh: Yeah.

Erin Allmann Updyke: If you're so deep in survival mode, you can't think that many steps ahead.

Erin Welsh: Yeah.

Erin Allmann Updyke: Yeah.

Erin Welsh: Yeah.

Erin Allmann Updyke: It's tough. But they're incredibly valuable. I also, so that everyone can say they know exactly how to contact, if you are exposed to a potential poison or you're worried you are exposed to something hazardous, you too can have the joy of calling your friendly neighborhood poison control center. The phone number is 1-800-222-1222 or you can go to poisonhelp.org. And another plug for the incredible poisonhelp.org website is that in 2022 they updated this website. So in addition, if you don't want to talk on the phone, you are not into talking on the phone, a lot of people aren't into talking on the phone, you don't necessarily have to. You can, through their website, fill out this information. They ask you very specific questions and you essentially go through the same exact steps as you would talking to someone on the phone which is great. But as of 2022 they also have an option where you can say that this is a test or an information call rather than an actual exposure.

Erin Welsh: Okay.

Erin Allmann Updyke: Which I think is just really, really helpful if you're kind of worried about something but you don't know if anyone is exposed but you're just worried about bringing something into your house or whatever it is. You can go there and get some information. It's phenomenal. And that's all I got, Erin. Poison controls.

Erin Welsh: Wow.

Erin Allmann Updyke: Love them.

Erin Welsh: Love them. Are there poison control T-shirts that we can...

Erin Allmann Updyke: You know what? We should find out.

Erin Welsh: We should find out.

Erin Allmann Updyke: And get some.

Erin Welsh: But until then, until we can get our hands on a T-shirt or make a T-shirt or design a T-shirt-

Erin Allmann Updyke

Or make a T-shirt. Until then, you can read more all about it. Specifically let me tell you where I got my information today. Because Erin already told you last week. Unsurprisingly, almost entirely my information was from the 2022 annual report of the National Poison Data Systems or NPDS from America's Poison Centers. It was their 40th annual report. It was really phenomenal. There is literally so much detail in this report. It's like it just keeps going on and on and on. But I also had a number of really interesting papers about the impact of poison centers both historically and today and then a list from the World Health Organization of a directory of poison centers, which isn't entirely up to date but is really interesting. You can find the list of the sources from this episode and every single one of our episodes on our website thispodcastwillkillyou.com under the EPISODES tab.

Erin Welsh

Thank you again so, so much Dr. Doyon for taking the time to chat with us and sharing those amazing stories. We had the best time, we really, really did.

Erin Allmann Updyke

We did. And also thank you for being so enthusiastic and like sending more ideas and things. We have so many more things to cover. I am thrilled about it.

Erin Welsh

Yes, totally.

Erin Allmann Updyke

Thank you also to Bloodmobile for providing the music for this episode and every one of our episodes.

Erin Welsh

Thank you to Tom Breyfogle and Lianna Squillace for the amazing audio mixing.

Erin Allmann Updyke

We love it. Thank you to everyone at Exactly Right network.

Erin Welsh

Thank you to you, listeners, for listening. We really hope that you enjoyed these last two episodes and learned more. And maybe if again if you have a poison control story that you want to share, please send it our way.

Erin Allmann Updyke

Yeah, love to hear it. Thank you especially to our patrons. Thank you so much for supporting us on Patreon. We really appreciate it. It means the world to us.

Erin Welsh

It really does. Well until next time, wash your hands.

Erin Allmann Updyke

You filthy animals.