

## [191: Resiliency Radio with Dr. Jill: How pesticide Exposure Could Be Ruining Your Health](#)

### **Dr. Jill** 00:13

Welcome to *Resiliency Radio* with me, Dr. Jill, your host. This is your go-to podcast for the most cutting-edge insights in functional and integrative medicine. I'm your host, and in each episode, we dive deep into healing and personal transformation, especially as it has to do with complex chronic disease, environmental toxicity, and so many other issues that are becoming, unfortunately, more and more common. Join us as we connect with renowned experts, thought leaders, and innovators who are at the forefront of medical research and practice. Today is no different.

### **Dr. Jill** 00:44

We have an episode with one of my favorite people and friends in the world with an incredible wealth of knowledge about environmental toxicity, Dr. Lyn Patrick. We're going to talk about the surprising effects of pesticides on your health that you may not even be aware of.

### **Dr. Jill** 01:00

Dr. Lyn Patrick graduated from Bastyr University in 1984 with a doctorate in Naturopathic Medicine and has been in private practice in Arizona and Colorado for 35 years. Now we're in the same state, Lyn. It's so exciting! She is a published author of numerous articles in peer-reviewed medical journals, a past contributing editor for *Alternative Medicine Review*, and recently authored a chapter in the newly released textbook of *Clinical Environmental Medicine*, released in 2019. She speaks all over internationally on environmental medicine, non-alcoholic fatty liver disease, endocrine disruption, metal toxicology, and other topics. She's currently on faculty for the Metabolic Medicine Institute Fellowship in collaboration with the George Washington School of Medicine and Health Sciences.

### **Dr. Jill** 01:46

I think we met originally with the Environmental Health Symposium, which you've been doing for years. Among physicians, it's one of the best known and respected. And now you're in Southern Colorado, in the same state as me. You have some fun adventures with hiking, kayaking, biking—all that fun stuff that we both enjoy.

### **Dr. Lyn Patrick** 02:06

Yes.

**Dr. Jill** 02:08

Welcome, Lyn! It is so good to have you back.

**Lyn Patrick, ND** 02:11

I miss you so much! I just have to say that. It's so great to be here. Thank you so much for inviting me. And as always, we're going to have a great conversation. Where should we start?

**Dr. Jill** 02:26

I was just thinking: The last time we had you on, we were a triad—three of us talking about after the wildfires. My big aha there was seeing the labs of patients that had been through the huge wildfire in Superior and Lewisville in 2021. It was two years ago. And just seeing the massive impact on the inflammation in the system, it looked like mold-related illness. We dove deep into that, but you mentioned before we came on live that there's some new data. Let's talk about wildfires because it's a big deal.

**Lyn Patrick, ND** 03:01

This month, March of 2024, I just finished my podcast, and I reviewed a paper published in the medical scientific literature by some amazing researchers. Jill, I can't even believe I read this paper. Have you ever seen those papers where half of them are mathematical equations?

**Dr. Jill** 03:21

Yes.

**Lyn Patrick, ND** 03:22

You're like: "Oh, my God, I'll never understand this!" I just tore it apart and the entire paper just blew my mind. These scientists built a house, had a wildfire that blew into the house, and then, using extremely precise analytical techniques, figured out where all the VOCs—volatile organic compounds—from that fire ended up. Here is the shocking conclusion of the study: As soon as that fire was out, the main source of VOCs were the ones that had been adsorbed—think

velcro—in the walls, the ceilings, and the floors of the house. They off-dusted for weeks and weeks, and they became the main source. We know those VOCs are not good for our nervous system, our lungs, or our gut—none of us. They became that main source.

**Lyn Patrick, ND** 04:28

But here's the shocking part: They looked at high-end HEPA filtration—those air filters we all tell our patients to get that are so important. We have to clean our air versus what I call the elbow grease application of washing and vacuuming the walls, the ceiling, and the floors. And guess which intervention was significantly more effective at getting rid of those VOCs?

**Dr. Jill** 05:00

I'm guessing the cleaning, right?

**Lyn Patrick, ND** 05:01

Elbow grease. I hear this from our indoor air environmental professionals—and I've heard you talk about this—that when you have a mold exposure event, the nasty parts of the mold, the mycotoxins, adhere to the walls, the ceilings, and the floors. It's no different with wildfire smoke. They looked at the effectiveness of air filtration to mitigate and remediate wildfire smoke exposure. Once the fire was out and the smoke stopped, it was virtually ineffective at getting rid of those VOCs. The only thing that got rid of the VOCs was that these scientists went in there, vacuumed the walls, ceilings, and floors, and scrubbed them.

**Lyn Patrick, ND** 06:02

I was sitting there with my mouth open, reading this article, going, "Oh boy!" I decided to name the theme of the podcast the *Humble Pie Podcast* because that's what we do as scientists, as clinicians, as doctors—we learn. And we change our behavior and what we tell our patients as a result of the science that comes out.

**Dr. Jill** 06:26

Lyn, that's what I love about you because you are always on the cutting edge. I have a story that's going to bring that to light. It's so interesting. My office was smack-dab in the middle of the Superior fires. I was in Hawaii when it happened. I remember looking back on the maps—I was thousands of miles away—and the fires

were all over. I thought: "There is no way I'm going to come home to an office." I knew it was going to burn down. Well, the Divine had protection over that office and it was okay. But it was massively smoke-damaged.

**Dr. Jill** 06:52

We didn't understand, and we came back in days after the fire. We all got so sick—we were nauseous and had headaches. Of course, right? It was loaded. We had no water. We had no heat, and we were there trying to see: How can we mobilize for the community with donations? We did some cool things with companies that were so generous to get stuff to the community. But we were sitting in there, and we were all getting sick. And for the first several weeks, going back to work, we all had to take turns in shifts because we would all feel so poorly. No surprise.

**Dr. Jill** 07:19

But get this: I had an environmental inspector come in who was an expert in fire and smoke remediation. He looked at everything and gave us an estimate. He brought in hydroxyl machines, which I think are a little safer than ozone, for a rehab of the air. But it still didn't help. We were doing this air quality thing, like you're saying—the machines and all that.

**Dr. Jill** 07:39

But here's the deal; I had this idea. I thought, "I know how to fix mold." He gave us a quote for some specialty company, like \$40,000, which was more than my insurance policy covered. Here's what I did, Lyn, and it worked; I thought: "I know how to remediate mold. Why don't I try an oil-based fog and then a deep, deep, deep clean and scrub?" And guess what? It was the same thing I would have done if we had had mold damage. It worked. It's exactly what you're saying.

**Dr. Jill** 08:04

And I had no idea of this data, but we all felt a million times better. We did our own elbow grease. My staff fogged. And then we had, not even an expert in environmental remediation, a good cleaner come in. We said: "We want everything wiped down. All the paper needs to be cleaned and everything." It was, I would say, 90–95% better with all of our symptoms. And that's exactly what we did.

**Dr. Jill** 08:31

My experience was like: "Mold works like this. It's just those films and VOCs. Let's try this." It's fascinating that the data now supports it. I was still like: "Did I do the right thing?" But we all felt better, and the evidence was in the sequelae that our health issues were improved after we cleaned. And of course, we cleaned the HVAC and there was a lot more to it than just that. But the big mover was simply cleaning our office.

**Lyn Patrick, ND 08:58**

You just proved the same data that the scientists came up with. There were pages of mathematical equations for how they figured out the movement—the migration from the air—to the surfaces.

**Lyn Patrick, ND 09:17**

In a former life, I used to work at a drug and alcohol treatment center treating nicotine addiction. My job was [not only] to run the treatment program but also to do the education. I came across this data that showed that cigarette smoke particles are electrostatically charged, the opposite of human skin and hair. Let's say they're positive and human skin is negative. There is an electrostatic bond that happens from smoke to human skin. It's not just that you're breathing this stuff in your lungs; it is coating your skin, your hair, and your clothing. And it stays there for a long, long time. It's the same idea. It's just that this is the house, and this is wildfire smoke instead of somebody who's puffing on a cigarette.

**Dr. Jill (pre-recording) 10:15**

Hey, everybody. I just stopped by to let you know that my new book, *Unexpected: Finding Resilience through Functional Medicine, Science, and Faith*, is now available for order wherever you purchase books. In this book, I share my own journey of overcoming a life-threatening illness and the tools, tips, tricks, hope, and resilience I found along the way. This book includes practical advice for things like cancer and Crohn's disease and other autoimmune conditions, infections like Lyme or Epstein-Barr, and mold- and biotoxin-related illnesses. What I really hope is that as you read this book, you find transformational wisdom for health and healing. If you want to get your own copy, stop by [ReadUnexpected.com](http://ReadUnexpected.com). There, you can also collect your free bonuses. So grab your copy today and begin your own transformational journey through functional medicine and finding resilience.

**Dr. Jill** 11:11

That was my experience with patients in my community, too. [Among] my community in Lewisville, some of them lost their homes, but a lot of them were still in a home that was massively smoke damaged. They would come in with migraines, headaches, rashes, and really severe symptoms. The remediators and the people would put in those machines to clear the air, whether it was hydroxyl, just air purifiers, or ozone. And just to be clear, those are supposed to be run when you're not in the building, but they're supposed to remediate the air. But what you're saying is that those things aren't even close to as effective as a good old fashioned—

**Lyn Patrick, ND** 11:46

Elbow grease. Done. We're learning.

**Dr. Jill** 11:51

Yes, exactly. I just shared this with you, and neither one of us has read the full article, but just this week, as we are recording (and I'll link this), there was an article in JAMA—which is a major medical journal—called "Wildfire Smoke and Its Neurological Impact". We'll have to have another part two on that specific topic.

**Lyn Patrick, ND** 12:12

We'll have to do another one.

Go ahead. Do you want to talk about pesticides?

**Dr. Jill** 12:19

Yes! I want to dive in. Everybody knows I grew up on a farm, and unbeknownst to me, [I was exposed to] those pesticides: Atrazine, glyphosate, and all these things. And I wanted to broaden it. We're going to talk about glyphosate. Maybe we start there, but I want to broaden it because there are so many other pesticides that are affecting health.

**Lyn Patrick, ND** 12:37

I have two podcasts on breaking crucial pesticide debacles. So we'll end there, but we'll start with glyphosate. I did a podcast on all of the glyphosate data looking at this question, which I know you and I are really interested in: If you change your diet to 100% organic, does your urinary glyphosate—which is how we measure it, in

the urine—go away? Sadly, no, it doesn't. This was a study that came out, done by one of my favorite researchers, Dr. Cynthia Curl, in Idaho, who did the original data.

**Lyn Patrick, ND** 13:25

Remember those studies that showed that when kids were taken off of conventional food and put on organic diets, their levels of two organophosphates—which are the pesticides that are most commonly used now—in their urine went down almost to non-detectable within 48 hours? It was immediate. Then they put those kids back on conventional diets, and they measured chlorpyrifos and malathion and the levels came back up within 48 hours. She was the first person to do this research in the United States. We were all like: "Oh my gosh, this is great!"

**Lyn Patrick, ND** 14:07

Just in 2023, she did a follow-up study on pregnant women looking at a change in their diet. They gave them 100% organic food and then switched them back to a conventional diet. But she did something different. She identified where they lived. Did they live within a third of a mile of an agricultural area? I think this was Southeastern Idaho versus Southwestern Idaho. She did her research. She plotted out exactly where they lived. And yes, there is glyphosate sprayed in that part of Idaho, plus the drift from Eastern Washington comes right over the mountains there. Here's what they found: If they lived further away than a third of a mile, they would have a significant drop in their urinary glyphosate levels. If those women lived within a third of a mile of an agricultural area, they did not have a drop in their glyphosate levels.

**Lyn Patrick, ND** 15:24

I'm going to lead into the conversation we both want to have: What do we do about that? I live in a small town with 3,500 people. Down the alley from me is a huge alfalfa field. As you know, Roundup Ready Alfalfa is GMO alfalfa. It is alfalfa that you spray with Roundup and then it kills all the weeds.

**Dr. Jill** 15:53

It survives and everything else dies.

**Lyn Patrick, ND** 15:57

I measured my urinary glyphosate levels. I know you have because I've seen the

results. We've got it. That led me to all the other studies that have been done in humans looking at glyphosate levels. All of that research—in a group of menopausal women, in a group of postgraduate young students—put together shows us that there are other sources of glyphosate besides organic versus non-organic food.

**Lyn Patrick, ND** 16:31

The winner of all the food that's ever been tested, and I'm going to include alcohol here, [with] the highest level of glyphosate that's ever been documented in a food. Do you know what food I'm talking about? Whole Foods conventionally grown hummus—weighing in at 2,379 parts per billion of glyphosate. That's extremely high. Why is that? Bayer—the company that now makes glyphosate—teaches farmers that if you don't want your grains or legumes to go bad in the field once they've been harvested, you go through that field and marinate them in glyphosate. Post-harvest desiccation is what it's called. Unfortunately, for some reason, those garbanzo beans get marinated. They turn out to be the most highly contaminated. That was a source.

**Lyn Patrick, ND** 17:43

To be clear, when Cynthia Curl's article came out—that shows that if you live within a third of a mile of the agricultural field, you can't get your glyphosate urinary levels down—they did go back and ask these women: "Were you 100% compliant?" Some said, "My husband brought me some takeout or Middle Eastern food or something." When they took those women out of the study, there was a significant difference. There was some contamination. It's hard when you've got people in a study and you don't sequester them off in a room to get them to just eat organic food.

**Lyn Patrick, ND** 18:28

The other thing—this came from the post-menopausal women's study—is that when they went back and asked the women in whom they had measured urinary glyphosate, "Did you have any wine?" with the ones who said, "Oh, yes, I did have wine," they took those women out. Then the same thing. We don't think about it, and I know my patients don't think about how wine has glyphosate in it. In fact, it has a lot of glyphosate. The winner for the glyphosate in wine contest, according to consumer reports—this is all published, so I'm not saying anything that isn't in the scientific literature—was Sutter Home white wine at 51 parts per billion of



glyphosate. That's a significant source of glyphosate. But so are Back to Nature granola and Quaker Oats granola.

**Dr. Jill** 19:26

Quaker Oats was the one I was going to say when you first asked me because I've heard the studies on the residue on conventionally grown oats. But I did not know that hummus... But it makes sense. We use some of these root vegetables to rehab soils. My thought is that maybe the legume family is even more absorptive.

**Lyn Patrick, ND** 19:46

Ooh, that's a really interesting point: Do these plants sequester glyphosate from the soil? That's a question for Dr. Huber. You can ask Dr. Huber for that.

**Lyn Patrick, ND** 20:07

All of this led me to look at all the research about: How do we get glyphosate out of our bodies? I came across some very surprising information. In the common vernacular, what we're told and what we read on the internet is that 20% of glyphosate is absorbable. When we eat something, 20% of it ends up in our bloodstream. But all of that came from animal research. When you look at human research, which is where they have real-life humans, and they give them—which is legal to do, believe it or not—a certain amount of glyphosate, between 1% and 6% of that glyphosate ends up in their urine. What happens to the rest of that glyphosate? These are living humans; they can't take a little piece of liver or kidney tissue. Surprisingly, they didn't look in the stool. But we have to assume that the rest of it ends up in the stool. It goes through the intestinal tract and ends up in the stool—the bowel movements of humans.

**Lyn Patrick, ND** 21:30

What we know from some of the research that's been done on the microbiome is that glyphosate is significantly toxic to the microbiome. There are scientists who have looked at the entire microbiome. I'm talking about the microbiome of the armpit, the private parts, the mouth, the throat—our microbiome varies so much from place to place—and the skin. Over half of that entire microbiome is potentially damaged by glyphosate. Those wonderful bacteria that help keep our skin at a certain pH and our intestinal tract healthy are susceptible to or killed by glyphosate. This is a serious problem.

**Dr. Jill** 22:29

I remember being shocked by the research because what Monsanto did when it first came out was: Let's check it in human cells. They didn't see a significant issue. But what you're describing is the thing they ignored, and they knew. It's a massive bomb to the microbiome because it chelates the minerals that are essential for healthy things like lactobacillus.

**Lyn Patrick, ND** 22:48

Exactly. And bifidobacteria. It's very bad for bifidobacteria. We've got this serious toxin—and I do mean serious. Do you remember the levels of glyphosate in your urine? Mine were 0.3 parts per billion.

**Dr. Jill** 23:08

Gosh, I may be able to pull that up while you're talking. The very first one I did was that first one that was no longer available, but it was compared to farmers on application day. I was three times the level of farmers on application day—whatever that would be. It was shocking. That level was with me [being] 100% organic. There were dogs that walked on lawns and slept in my bed. There were other factors. But I was one of those N of 1s that was so fastidious on my diet. This was probably 8 or 10 years ago. But it proves your point that I was getting exposures that probably weren't from my diet.

**Lyn Patrick, ND** 23:49

I was 0.3 parts per billion in my urine—three times the level I'm referring to. So, 0.1 parts per billion is the level that Dr. Gilles-Éric Séralini—the famous French scientist—found was toxic in his rat population. Do you remember that he did that study where he looked at the entire lifespan of rats? In the ones that he fed glyphosate from corn, all of the female rats developed breast tumors and all of the male rats developed liver tumors. That was 0.1 parts per billion. We know that for rural Americans in that study, their levels of glyphosate were as high as 3.3 parts per billion—so 30 times that high.

**Lyn Patrick, ND** 24:40

In the NHANES database of the top 4,700 people that the CDC measures, the median was about 1.5 parts per billion. That's what Americans are walking around with in their urine. All of this got me really curious about: What are we going to do about this? If it's true that we're exposed to this, and even you and I, who are

probably equally fastidious about eating organic, and I don't even drink so [inaudible].

**Dr. Jill** [25:18](#)

Me neither. That's the thing. There's no wine or beer in there.

**Lyn Patrick, ND** [25:21](#)

No wine or beer, and definitely no Whole Foods hummus. But I live down the alley from that Roundup Ready Alfalfa field. I started thinking about: Can we detoxify glyphosate? Is it possible? I started getting messages in my inbox: "Detoxify glyphosate now!" I looked at those. I love science. I was trained by this guy named Jeffrey Bland before I ever went to medical school. I fell head over heels in love with science. And I'm afraid that that concept of critical thinking that we adhere to so closely—we may have lost it.

**Lyn Patrick, ND** [26:12](#)

What these product manufacturers were saying is: We have six people who had this level of glyphosate in their urine. We gave them this magic product, and then we checked them again and they had no glyphosate in their urine. I thought, "Shouldn't they have more?" If you're trying to get the glyphosate out of their body, shouldn't their urine levels go up? Isn't that what you want?

**Lyn Patrick, ND** [26:36](#)

I contacted them: "Hi, it's just me checking in. I think what you're saying is that you may have found a way to push glyphosate into further storage inside the body." What are you doing? I never heard back from any of them. Obviously, they weren't interested in my comments.

**Dr. Jill** [26:56](#)

This is what I love about you, Lyn. Even on our boards, we're similar in so many things. You often see Lyn Patrick's comments and they're always like: Have we thought about this? And here's some evidence for this. I love and adore you for that because you bring the science to the...

**Lyn Patrick, ND** [27:11](#)

Thank you, Jill.

What I realized from the study with humans that showed that only between 1% and 6% of the glyphosate comes down in the urine... Dr. Zach Bush—I don't know if you know him, but he's kind of a brainy guy—did a study looking at the effect of glyphosate on the mucosal layer in the intestines, showing that it does in fact destroy the mucous layer. For those of you who aren't into the mucous layer of the intestines, I know it sounds gross, but it's critical because the majority of the microbiome lives there. We think that the microbiome is floating around in the intestinal tract, but no, it's not. It lives in this beautiful little layer, right on the border of the tissue, the mucosa of the intestines, because there's so much good food for the microbiome there. If you're eating a biocide that destroys that, it's going to wreak havoc with your intestines.

**Lyn Patrick, ND** 28:21

I thought: "Is there any evidence that having a good digestive tract functional rate of elimination decreases the toxicity of glyphosate or at least decreases the amount that's absorbed?" There is some data for people who eat six servings of veggies a day. They do have lower levels of glyphosate in their urine, so they're absorbing less.

Do you know Dr. Russell Jaffe?

**Dr. Jill** 28:55

Yes.

**Lyn Patrick, ND** 28:56

He's the senior research fellow at NIH. He's a brilliant guy. He said, 'Absolutely.' The bowel transit time—the time from when you eat something until it comes out the other end—from 14 to 18 hours is optimal. The average in America—you're not going to like what I'm about to say—is like 96 hours. Even if you have normal bowel movements, it's taking that long for food to get through your gut.

**Dr. Jill** 27:25

And just to be clear for people listening, the reason is that we absorb 95% of toxins, bile, and things in the bowel. The longer it's there, the more we reabsorb this toxic load.

**Lyn Patrick, ND** 29:40

Exactly. We don't want things to go through too fast—we don't want to get diarrhea—but 14 to 18 hours; normal stools. That's going to decrease the time that glyphosate stays in the intestinal tract. And if it's true—from the little research that we have—that 94–99% of the glyphosate we're exposed to comes out through our intestinal tract, that would be helpful.

**Lyn Patrick, ND** 30:10

The purveyors of specific types of fibers that are supposedly magic at detoxifying glyphosate don't have anything over regular fiber that we get from whole foods, vegetables, and fruit. I would love to have millions of dollars and do the research correctly. But so far, I think that that appears to be, from all the research I could find that was published, the best application to minimize the effect that glyphosate has on our bodies.

**Lyn Patrick, ND** 30:50

People forget about alcohol. Wine is wine, right? People forget that non-organic wine has glyphosate in it. There are two good studies that I reviewed on the podcast—one from Europe and one from the United States—that Consumer Reports did, showing significant amounts of glyphosate in wine. I have a friend who lives in wine country. She said: "All the conventional vineyards spray glyphosate because they don't want weeds growing between the grape plants." I don't know why. I think grapes would be fine. But that's the standard for viticulture and growing grapes.

**Lyn Patrick, ND** 31:36

The other is drinking water. I did a deep dive into this. Some municipalities can get the glyphosate out of water and some can't. There's documented evidence of contamination of drinking water with glyphosate. The Environmental Working Group has taken that out of the EPA data, and there are published studies in the scientific literature that show considerable amounts.

**Lyn Patrick, ND** 32:03

The good news is that it's easy peasy to get glyphosate out of drinking water. You just need activated charcoal. Even those very, very economical pour-through filter systems will do it—with the little activated charcoal filters. You have to change them on a regular basis, but they will do it.

**Lyn Patrick, ND** 32:27

The one study I found that shows that you can bind something in the intestinal tract—I forgot to talk about this so I'm backtracking—to glyphosate is clay.

**Dr. Jill** 32:44

That's what I was going to ask. Charcoal and citrus pectin—I was wondering about those.

**Lyn Patrick, ND** 32:49

Montmorillonite clay. They saw in vitro that the clay [was] bound to the glyphosate. It was a significant binding, meaning it just wasn't momentary. It was a binding that then lasted for hours. But here's the thing: It's best at a pH of 2 and very weak at a pH of 7. We know that the only place there's a pH of 2 in the human body is the stomach. We can assume that if we took clay with our food, it would bind glyphosate. The downside of that is that clay also interferes with mineral absorption. We don't want to do that for a long period of time, because that would not be good for the mineral absorption that we need. But at least we know that clay does have the capacity to do that.

**Lyn Patrick, ND** 33:50

There was not any good research that I could find for activated charcoal in the intestinal tracts of a human or animal body. So maybe that would happen, but we don't have any evidence for that. We have to do the very best that we can because glyphosate is very toxic to the human microbiome. The study that I looked at looked at every separate part of the microbiome. And in every single one, Jill, at least 40% of that microbiome was susceptible to glyphosate—the intestinal microbiome.

**Dr. Jill** 34:33

Think about the babies that are given formula. To me, that's the bigger tragedy—the small size [of babies] relative to adults who are given formula that we know is conventional soy. Any thoughts on that? Obviously, if mothers have a choice, [they should opt for] organic formulas. But that's a big deal.

**Lyn Patrick, ND 34:55**

I have to say this because I talk about toxicants that are found in breast milk: Breast is always best. I don't even care if it's a situation like in the Arctic—toxins migrate northward towards the North Pole—where Inuit women have very high levels of PCBs in their breast milk. I still think breast milk is good because it's got its own microbiome. You can't get it anywhere else. It's not in formula. So yes, breast is best. And then, if you have to use a formula, a USDA organic formula—even soy—is going to be much better than a conventional formula. And the simplest, most affordable, pour-through pitcher filtration. They're called pitchers. They are now making glass ones, which I'm very happy to see.

**Dr. Jill 35:57**

Me too. Otherwise, there are plastic ones that are a dime a dozen, and it's nice to have the glass. Question: Did you come across a lot of companies that make humic and fulvic acids that claim that they detoxify glyphosate? Is there any evidence of that?

**Lyn Patrick, ND 36:10**

The one study I found was a study that Dr. Zach Bush did, but it was in an in-vitro model. It was a brilliant in vitro model. In vitro just means it wasn't in a living being; it was in the laboratory. They tried to create a synthetic intestinal lining, which I wish I had seen but I just had to read about it. This was a published study. What they found was that the glyphosate did attack that mucin layer. By using humate and fulvate, which are [from] dirt—acids that are found in dirt—they were able to minimize that damage.

**Lyn Patrick, ND 36:57**

I have to say, that's in a plastic model, in a non-living scenario, which is very different than in a living scenario where you're using an animal—a rat, a mouse, or something—where you can look at what's going on biologically. I would love for them to do that in an animal so that we can see what it really looks like in an animal.

**Dr. Jill 27:24**

The best thing is trying to avoid it, but we can't, like you said with the spraying off. I think I read a study—this has been a few years now—that there were traces found in organic California wine. It's that airflow or breeze that takes it to other places.

**Dr. Jill** 37:38

Let's shift to pesticides in general, because that is another huge, huge thing. There are so many we could talk about. What are the top ones of your concern? And what do we do about it?

**Lyn Patrick, ND** 37:57

I have to talk about the breaking news because this is so important. In the '70s, we started replacing the Rachel Carson organochlorine pesticides with organophosphate pesticides because they were supposedly safe, effective, and harmless, which we know now is absolutely not true. One of those pesticides is called chlorpyrifos. Of all of the organophosphate pesticides, let's just call chlorpyrifos the poster child, because we have more evidence for neurological damage in both developing fetuses and young children for chlorpyrifos than any other pesticide. Ten years ago, the EPA started trying to phase out chlorpyrifos. It took until 2021 for them to be able to take it off the market.

**Lyn Patrick, ND** 38:54

I got something in 2023 across my inbox that said, "Chlorpyrifos is coming back." I thought, "Oh, no!" What the pesticide companies are doing—which is, unfortunately, the way the game is played—is suing the EPA to get registration, which is the legal thing you have to have for a pesticide to use it. You have to have legal registration to get that registration back. In fact, they got so dirty that they sued the head of the EPA personally, Andrew Wheeler. They sued him for everything he owned. This is what happened. This is not a secret. It's everywhere. This happened in 2023. I don't know who got to the judge, but the Eighth Circuit Court potentially reversed the ban. Some things have to happen, but if things proceed as they are scheduled, chlorpyrifos will come back.

**Lyn Patrick, ND** 40:02

It is the most neurologically damaging pesticide that's ever been proven to be neurologically damaging. And it is heavily used. Half of all the apples in the country that are conventionally grown have chlorpyrifos residue on them. Flip a coin [and see] whether your conventionally grown apple is going to give you a little dose of chlorpyrifos when you eat it. Green vegetables like kale also [have it]. It's used widely. It's used on grains. It's used on sugar beets, so it's in sugar. And yes,



chlorpyrifos residues are measured in conventionally grown food.

**Lyn Patrick, ND** 40:48

We have to prevent that from happening. There is a way that citizens and consumers can directly work with either Pesticide Action Network, my favorite organization, or Organic Consumers, which is another wonderful organization that is actively working to lobby the Environmental Protection Agency and all of our congresspeople not to let this happen. That's chlorpyrifos. The only way to avoid chlorpyrifos is to eat USDA organic food.

**Lyn Patrick, ND** 41:25

There's this thing called, I'm sure everybody here is aware of it: The Dirty Dozen and the Clean Fifteen of the Environmental Working Group. That information is [from] the FDA database for the most heavily contaminated fruits and vegetables. But what they do not test for—and everybody needs to know this—is dairy products, meat, and many processed foods. They're only talking about fresh fruits and vegetables. They don't test one of the most highly contaminated foods with pesticides in America, which is wheat. Wheat is highly contaminated by some of the most toxic pesticides.

**Lyn Patrick, ND** 42:19

Dr. Cynthia Curl, whom I mentioned before, did that research. She looked into the EPA database. There's a 6,000-fold difference in the toxicity of pesticides. She looked at the most highly toxic ones. What foods are those pesticides used on? The Dirty Dozen and the Clean Fifteen do not use that methodology. What she found is that wheat, brassica, and some other grains, like corn, are the most contaminated with the most toxic pesticides. We have to create a hierarchy because, as you know, it is challenging to eat 100% organic.

**Dr. Jill** 43:10

Yes. And you really can't eat out at all. Even in Boulder, it's rare that you find an all-organic restaurant. That's almost unheard of due to the oils, seeds, and things that they use. It's so fascinating.

**Dr. Jill** 43:24

I've always wondered [about] the fad of autoimmune paleo diets. Paleo diets eliminate grains and legumes. In my mind, those are [not only] highly contaminated with mycotoxins but also pesticides. I always wonder if some of the improvement isn't just because of eliminating some of the big sources of pesticides but also mycotoxins.

**Lyn Patrick, ND** 43:45

I think about that all the time. And that's one of the problems with our industrial agriculture—it sterilizes the soil and makes it easier for molds and mycotoxins to grow into the plant. They don't just grab onto the roots; they are found in the plant. The grains that are conventionally grown are higher in mold residue and mycotoxins than the grains that are organically grown. I think that the hierarchy that we're constructing right now is that if we want to put stuff at the top of the "Do not eat" list, it's not just the Dirty Dozen and the Clean Fifteen. It's grains, specifically wheat. That's from Dr. Curl's research.

**Lyn Patrick, ND** 44:40

I have to talk a little bit about conventionally grown brassica. Those are cauliflower, Brussels sprouts, cabbage, kale, watercress, broccoli sprouts, and broccoli. All those wonderful foods that are so good for us also happen—if they're conventionally grown—to be contaminated with some of the more toxic pesticides. For instance, if you go to Whole Foods and get a smoothie, you're not going to get any organic fruit and vegetables.

**Dr. Jill** 45:13

And you're getting a high concentration. I've seen some of the most toxic thallium levels in people who drink green drinks all the time, right?

**Lyn Patrick, ND** 45:19

Right. I was just going to tell you about a case of a man who had significant neurologic problems—brain fog, fatigue, paresthesia, or numbness and tingling. His doctor mistakenly thought he had metal poisoning. He went through a year of chelation therapy. He did not get better. Then he went to see my mentor, Dr. Walter Crinnion, who did a thorough intake on him and found out he had been going to Whole Foods every morning to get a great big 32-ounce green smoothie and that his organophosphate pesticide urine levels were through the roof as a result.

**Lyn Patrick, ND** [45:58](#)

We have to think about: Where is our food coming from? And foods that are supposed to be good for us, like brassicas or smoothies, are they really good for us? Not if they're made from conventionally grown fruits and vegetables.

**Lyn Patrick, ND** [46:14](#)

There's one more thing I have to tell you about because I did my podcast on that this month. The Environmental Working Group—God bless those people!—just published two studies. One of them was that they looked in conventional cereals for a contaminant—it's called a pesticide but it's really not—called chlormequat. "Chlor" (like chlorine), "me," and "quat." "Quat" stands for quaternary ammonium compound, a toxic additive to personal care products. This is a growth regulator. It's not a pesticide. It's used extensively in Canada to grow oats. Quaker, in addition to other oat manufacturers, uses oats from Canada. The environmental Working Group looked in those Quaker products for levels of chlormequat.

**Lyn Patrick, ND** [47:15](#)

EWG did a lot of research, looking at what an acceptable level is. They figured out that it's 30 parts per billion. Above that, it's going to do damage. This is an endocrine disruptor par excellence. It's a growth regulator. It alters plant hormones. If you have a beautiful, lustrous, great big stock of oats and it falls over, it's harder to harvest. These growth regulators are used to create these stumpy stocks of oats that don't fall over and are easier to harvest.

**Lyn Patrick, ND** [47:54](#)

They found 300 parts per billion of chlormequat in Quaker oatmeal. The EPA doesn't regulate chlormequat. I don't know why. It's a problem. Then they looked in the urine of people in the United States of America. They got access to several different studies where they were collecting human urine. In 2017, about 65% of the urine of these patients had chlormequat in it. It's up to over 90% now, in 2023. They looked from 2017 to 2023, and they found not only more people, but the levels of chlormequat in the urine were also going up.

**Lyn Patrick, ND** [48:44](#)

The problem with chlormequat is that in the animal studies, you're looking at decreased levels of testosterone, altered thyroid hormone, deformities in the womb

regarding the development of the skeleton—skeletal deformities, lower birth weight, lower birth length. Babies are being born not only small for their gestational developmental age but also shorter. None of that is good. That's all bad.

**Lyn Patrick, ND** [49:21](#)

Remember, chlormequat is outlawed in the United States so far. But in 2018, and just recently in 2020, the company that makes chlormequat successfully lobbied the EPA to allow higher levels of contamination for imported oats. I think in 2021 or 2022—I can't remember—they formally asked the EPA for registration, meaning "We want to bring chlormequat into the United States."

**Lyn Patrick, ND** [49:57](#)

The EWG, doing a beautifully crafted strategic preemptive strike, published this data just last month: In the humans—which is on their website, EWG.org—they looked at about 14 different cereals. Organic granola, the one they tested, had no detectable chlormequat in it. There was one commercial cereal that had no detectable chlormequat, but the other 13 had significant levels of chlormequat in their cereal box. In the Quaker Oats box—good old Quaker Oats—or the cereal, Quaker's granola. That's the other one that I think has to be avoided because it's such a strong endocrine disruptor. We know there are endocrine disruptors in our environment, but this is an obvious one. This is a no brainer.

**Dr. Jill** [51:02](#)

We'll be sure, if you're listening, to link up some of the places where you can be an advocate or a political voice. You already gave us some of the websites, Lyn, and I'll make sure to list all of those wherever you're watching. If you have a voice and have a say, I think the more of us who can get together and talk about the toxicity and why we don't want that in our food supply, the better.

**Lyn Patrick, ND** [51:23](#)

Yes. Right now, the Environmental Working Group—if you just go to their website and type 'chlormequat' into the search engine—they've got a whole bunch of pages on chlormequat and how to take action. They make it very easy. It will take you no more than a couple of minutes.

**Dr. Jill** [51:41](#)

I'll link to that for sure. Our last bit here. This is overwhelming, and it's really

important information. We're all swimming in toxic soup. What would be your takeaway for someone who is a mom trying to feed her kids? What would be a few very practical, maybe somewhat affordable, things that we can do to decrease our toxic load?

**Lyn Patrick, ND** 52:03

I have a million, as you probably [inaudible]. But I have to say that our dear friend and colleague, Dr. Michelle Perro, who's a board-certified pediatrician, commissioned a study to look at the question: Is it more expensive to eat an organic diet? She compared a standard American diet—the cost of going to the grocery store and buying standard American diet items versus whole food (meaning fruits, fresh vegetables, cooking up organic oatmeal; not having a lot of processed foods) organic diet. And guess what? It's the same price. No longer can we say: "I'm a single mom. I have four kids. I can't afford to do that." You can.

**Lyn Patrick, ND** 52:59

Dr. Perro has an entire book of stories about what happened in her practice when not just the kids but her families went on an all-organic diet. It reversed kidney failure and Crohn's disease—I could go on and on. But it's worth it. The amount of money that we spend on our health failing is so much more than what we can invest in a whole-food organic diet.

**Lyn Patrick, ND** 53:31

The other thing is my favorite: Sweating. It's a very effective way to get out a lot of toxins, including the organochlorine pesticide, which is held in our tissues. We hang on to those in our fat. I've helped folks who didn't even have money to buy a sauna or to get a pass to the gym to go to the sauna. Sweat. You go in your bathroom, you put a towel under the door, and you turn the heater on—voilà! An instant sauna. You can sweat. Sweating for 20 minutes a day, followed by a good soapy shower to get all of those fat soluble toxins off your skin, is wonderful. I am lucky enough to have a sauna in my house. I also have a cold plunge. Going from that 150-degree heat to that 40-degree cold is absolutely life-changing, I have to say.

**Lyn Patrick, ND** 54:36

The other thing is the simple, inexpensive, life-saving nutrients that we can take that cost pennies a day, like N-acetyl cysteine. Pretty much everybody, unless you

have an active peptic ulcer, can take it. There are, right now, I think about 30,000 articles in PubMed on N-acetyl cysteine in both animals and humans. It's unbelievable—the ability of N-acetyl cysteine to help the body detoxify. Vitamin C, Vitamin E, Magnesium—all of those basic nutrients are so crucial in helping create an optimal situation in terms of liver function and kidney function.

**Dr. Jill 55:24**

And that's where we detoxify. And then bowel function: Making sure you're getting that fiber—as we started out—practically from food if possible. Or you can add psyllium, chia, flax, or something. It's wonderful.

**Lyn Patrick, ND 55:38**

Grind them up. Put them on your cereal. It costs pennies a day. Do you remember that they did this wonderful study in one of the Scandinavian countries? It was a prospective study where they divided a group of women in half. They gave half of them the equivalent of two tablespoons of ground flax seed a day. They followed them for six months. Then they said, "Okay, stop." Then they followed them for several years. The group that took the flax seed had half the incidence of breast cancer just from that simple intervention of flax seed fiber.

**Dr. Jill 56:18**

It's simple. So much of what you've shared is very practical. It doesn't have to be extremely expensive. And it's approachable to pretty much anyone, even with a family or a smaller budget.

**Dr. Jill 56:31**

Lyn, we could go on and on and on. This has been so chock-full of great and practical information. I know people are going to appreciate this. Where can they find you and [learn] more about you? You've got a training coming up, I think.

**Lyn Patrick, ND 56:44**

Sure. I used to be a clinician. I had a practice for many, many years. Now I spend every waking moment of my life doing podcasts and training physicians in environmental medicine. I have a training platform called EMEI. It stands for Environmental Medicine Education International. We'll put the link to the website in the show notes. EMEI.org.

**Lyn Patrick, ND** 57:09

Dr. Jill, I have to tell you this. We did do a course. After East Palestine, I got so angry about the lack of any public health help for those people that we did a whole course that we're rewriting now. That will be for the public on the basics for self-care, water, air filtration, and supplements, and what to do if you have a chemical disaster like East Palestine. It's just basic public health information that should have been available to those folks that was not made available to them.

**Dr. Jill** 57:44

Awesome. Thank you for your amazing work in the world. We will link to the website and all the notes that we talked about today. Lyn, you are a treasure. Thank you again for all that you do for all of us!

**Dr. Jill** 57:58

Well, that's a wrap with Dr. Lyn Patrick and everything you wanted to know about pesticide exposure and how to decrease your risk. Thanks so much for joining me for another episode of *Resiliency Radio*.

**Dr. Jill** 58:08

You know you can find all episodes on iTunes, Stitcher, Spotify, or wherever you watch or listen to podcasts. Won't you please stop by and leave a review so we can reach more people? Be sure to tune in as I put out a new episode every week. And if you want to look at transcripts or any more information, you can go to my website, [JillCarnahan.com](http://JillCarnahan.com), where you'll find all the transcripts and all the episodes that have been produced. Be sure to like, subscribe, and hit the bell so that you can be notified of the next subscription. Thanks so much, and have a great evening!