

**3 Takeaways Podcast Transcript**  
**Lynn Thoman**  
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**Ep. 138: A Former OSHA Head Exposes the Science of Deception That Allows Dangerous Chemicals To Go Unregulated**

**INTRO male voice:** Welcome to the 3 Takeaways Podcast, which features short, memorable conversations with the world's best thinkers, business leaders, writers, politicians, scientists, and other newsmakers. Each episode ends with the 3 key takeaways that person has learned over their lives and their careers. And now your host and board member of schools at Harvard, Princeton and Columbia, Lynn Thoman.

**Lynn Thoman:** Hi everyone, it's Lynn Thoman, and welcome to another 3 Takeaways episode. Today, I'm excited to be with David Michaels. David is an epidemiologist, which is essentially a disease detective. He was the chief safety officer for America's nuclear weapons program, responsible for protecting workers, the community and the environment in and around the nation's nuclear weapons complexes. Then he was named head of the United States' Occupational Safety and Health Administration, known as OSHA, which is the single most important job in worker safety and health in the United States.

**LT:** Running OSHA was a dream for David, but the job was eye-opening, he discovered a new playbook that was being successfully used to fight the regulation of toxic chemicals and toxic products, putting the American worker and people everywhere at risk. I'm excited to find out more about what David calls the manufacturer of doubt and the science of deception, and how we can fight back. David's book, which is wonderful is *The Triumph of Doubt*. Welcome, David, and thanks so much for our conversation today.

**David Michaels:** Thank you, Lynn. It's a great pleasure to spend some time with you.

**LT:** It's a pleasure for me as well. You published a disclaimer on the official US government OSHA website. What did it say? And why did you feel compelled to do that?

**DM:** That's right, I get a lot of questions about that. I published a disclaimer about the standards, the OSHA issues, they require employers to protect workers, these are chemical standards, and people believe that when OSHA issues a standard, it tells people that workers are safe. And OSHA standards are so old and so out of date and don't cover so many important chemicals that I issued the statement saying, "Please don't follow my agency standards, you can do better." That most large employers do ignore OSHA standards and protect workers as a stricter level, lower exposures below OSHA standards. It's funny, a lot of people thought it was courageous for an agency director to say that the agency isn't doing a good job, but I think it's important in these jobs to tell the truth, and when you look at OSHA standards, they're not effective.

**LT:** That is just shocking to me.

**DM:** I think when people learn more about the inadequacies of the programs we have to protect workers, but also the public, you see that often, far too often, in fact.

**LT:** Why don't OSHA and other federal agencies issue better standards?

**DM:** Certainly from the OSHA point of view, the law is written in a way that makes it very difficult and very resource-intensive to update standards. OSHA have standards for about 500 chemicals, but most of those were issued by OSHA when Congress passed the OSHA law and said, OSHA you could just take some standards that are out there. OSHA has only issued about 30 new standards in more than 50 years, only about five in the last 25 years or so, and as a result, most of OSHA standards are...

**DM:** To say they're out of date is an understatement, they come from the 1960s, and some of them were out of date then. But the law is written in a way that it takes OSHA years and many millions of dollars, which the agency doesn't really have for each new standard. So under my leadership, we issued that update to the silica standards. Silica is a dust. It causes silicosis, causes lung cancer. Millions of workers are exposed in construction sites and boundaries elsewhere. OSHA started the process of updating that standard in 1997, and we issued it in 2016. So really a 19-year process.

**LT:** Wow. There are currently, I'm going to say, tens of thousands or maybe hundreds of thousands of chemicals that we interact with in our daily lives, and only a small fraction of these, it sounds like are regulated. Can you give some examples of toxic chemicals that people are exposed to in a variety of different ways?

**DM:** Sure. And certainly, I can give you many examples of ones that we don't have regulations for. Something that's in the news all the time are these chemicals called PFAS, P-F-A-S. There are chemicals that have a flooring component in their molecules, and they're used in Teflon and Gore-Tex, and they're called "the forever chemicals", 'cause they really don't ever break down. We have pretty good toxicology and epidemiology on a handful of them, but there are at least 9,000 different chemicals in this category.

**DM:** We happen to have good information about this handful because there were some lawsuits related to exposures near a DuPont factory in West Virginia. And DuPont and the people who were suing them were community members who are exposed to this chemical. DuPont agreed to pay for three epidemiologists to do extensive work. So we know a lot about two of these chemicals, and EPA is moving to regulate them and really lower exposures to almost infinitesimal levels, because there appears to be no safe level exposure, but that's for two out of, say, 9,000. We just don't have data on the other 9,000.

**LT:** And those are 9,000 that are in the same chemical family?

**DM:** Exactly. And that's true for lots of different categories of chemicals. We have a lot of flame retardants, for example. They're used in furniture and upholstery, used to be used in pajamas, and we know a little bit about some of them, but we don't know that much, but there are chemicals we know a great deal about them, we also don't have regulations for them, because at least from the OSHA and EPA point of view, it takes years to issue these chemicals, these standards. We have this image that the government is protecting us and I saw from the inside that it's really only an image, it's not the case -- there are so many exposures that we have no regulations about.

**LT:** And these exposures come, you mentioned, in flame retardants, which can be in sofas and rugs and clothes, in waterproof material which can be enclosed, presumably in foods we eat or

packaging, or personal products we put on our bodies, our skins?

**DM:** That's exactly right. There are two different things. One, there are chemicals we know great deal about that we all regulate, and then there are these other chemicals that we just don't know much about. And the way the system works is we presume their innocence, and that's a way that the manufacturers of these chemicals can avoid essentially protecting people. We have a criminal justice system that says that people are innocent until proven guilty, and that is absolutely the way it should be because we're dealing with people here, and you wanna make sure that when you convict someone that's beyond the shadow of a doubt, and that's how our criminal justice system works.

**DM:** So without explicitly saying so, the manufacturers of dangerous chemicals and polluters have taken that concept and apply to two chemical exposures, and the laws often follow that. The law say that the Agencies have to prove a chemical is dangerous before it gets regulated. Some people call that "the body in the morgue" method. By the time you can show it's dangerous, that it's killing people, it's too late. And even if then you can regulate, it often takes years after that point to regulate. You've got this long tail of the effects of exposure where people continue to be getting sick for decades after the regulation.

**LT:** That is horrifying. You have written a book about manufactured doubt and the way companies defend their products once there's a question about their toxicity, can you talk about manufactured doubt and what the product defense playbook looks like?

**DM:** I was inspired to write this really because of the work I was doing in the government and seeing how corporations that didn't want their products to be regulated would hire these disinformation experts or product defense experts, these are scientists, they're scientific consulting firms, whose job it is to manufacture uncertainty, it's the tobacco model. It actually predates tobacco, but we call it tobacco playbook, because tobacco was so successful delaying by the government, and by public health authorities, the recognition of the hazards of cigarettes for years. That same playbook and some of the same scientists went from tobacco to working for lead, for beryllium, for baby powder, for all these different chemicals, using the same technique, which essentially to say, "Well, we don't have absolute proof that this is safe, but there are questions about every study that says it's dangerous."

**DM:** To be a product defense scientist is a very lucrative profession. I could make a lot of money if I want to go over to the dark side and try to claim that all of these chemicals are not dangerous, or at least say, there isn't adequate evidence to protect people from those chemicals. And that's the model, the business model is to produce whatever reports, whatever study their client needs. And I've look at hundreds of these studies done by firms that do product defense, and the only time I've seen a report that says, "Look, this chemical is really dangerous," is a report that was paid for by one industry to stop another industry from being successful. If these product defense firms issued reports saying, "Look, the products made by our clients were dangerous", they'd go out of business. Their business model is to essentially make it look like these things aren't dangerous.

**LT:** Can you talk about some common product defense strategies?

**DM:** Well, the most common one is something I call a strategic literature review, where you look at the literature and you say, "Well, this study is problematic, that study is problematic." We never have perfect studies when we're trying to figure out the health impact of different chemical

exposures. Ideally in epidemiology, we'd like to see a randomized clinical trial where you have people randomized into two groups. One group is exposed to the substance of interest, the other one isn't, and you follow them for 30 years and figure out who gets sick, you can't do that with toxic chemicals, we do that with drugs to see if they're effective, but we can't do that with toxic chemicals.

**DM:** So you have to have observational studies where you figure out what people were exposed to decades ago, and then you see what happens to them now, and there's always limitations to those studies, they're not perfect, you can't control them. And you have animal studies where you feed animals or you have them breathe often large amounts of the substance because that's the only way really to see the effect, and that's not perfect 'cause they are animals, they're not people. So you can look at the literature and say, "You haven't proven that there's a relationship." Even though study after study will show if there's a relationship in people and animals. And I've seen it over and over again.

**DM:** I mean, an example that has been in the press recently is around talcum powder, and you may have seen that Johnson & Johnson recently announced that they will no longer sell a talcum powder-based product, Johnson's baby powder. They're going to shift to non-talcum powder, cornstarch, I think. Since the 1970s, there have been studies showing the talc, the mineral the powder is based on, is mined or is found in mines with asbestos. We know asbestos causes lung cancer, mesothelioma, which is a cancer of the lung and other diseases. But Johnson & Johnson and other talcum powder manufacturers and mining companies have always contended that that's not the case, there was no asbestos in there, but it's been found over and over again. There were a number of studies that started to show that women with ovarian cancer reported more use of talcum powder on their body than one who didn't have ovarian cancer.

**DM:** As these studies were accumulating, the National Toxicology Program, which is a special agency within the federal government but it crosses all these different departments and agencies, it includes the National Institute of Environmental Health Sciences, the FDA, OSHA. In 2000, the Board of Scientific Counselors considered talcum powder and whether it should be labeled as a cancer-causing substance. Well, the companies that manufactured talc-based products, including Johnson & Johnson and other ones, hired some of the same scientists who had worked for tobacco, and what they did was they said, they pulled apart all the studies and made the case that there was not enough evidence to say that talcum powder could cause cancer.

**DM:** The consultants who were hired by the talc industry literally said, "We're going to confuse them. So time to come up with more confusion." And they did that, and the National Toxicology Program stopped any effort to label this as a carcinogen. Since then, there have been dozens of studies showing the relationship between ovarian cancer and talcum powder exposure. Not every study is positive, there are a bunch of studies that don't find a relationship and some that do, but there have been huge lawsuits against Johnson & Johnson, and they have to actually stop selling their product as a result of this. My most recent book, *The Triumph of Doubt*, goes through different industries, and you can see, and in fact, not just what's in workplaces, but the air we breathe, the water we drink, what's in our refrigerator, the automobiles we drive.

**LT:** How did the Purdue Pharma campaign for opioids work?

**DM:** Purdue Pharma realized that they needed to make it look like the products they were making,

the opioids they were making, were not addictive, which of course is nonsense. And so what they did was they picked one letter to the editor that didn't go through a peer review or anything like that. That really had little applicability to the use of oxycodone, but this one letter, to the editor said, "We gave a bunch of people this drug, we didn't follow them for very long, but none of them were addicted."

**DM:** And so Purdue went to town on that, and they claimed that was a major study, but they went far beyond that as well. One of their experts came up with this idea of pseudo addiction, this idea that people aren't really addicted, but they think they might be addicted and they want more drugs. And so the only thing you should do is give them more drugs. Of course, it's nonsense, and even the person who is promoting that now has recanted and said, "Look, I was totally wrong." But the only difference between what Purdue did versus some of these others is they used their own experts, they hire didn't use any of these product defense consulting firms.

**LT:** Can you give examples of products, maybe products that are used to wrap food or drinks that are dangerous, that there is data that they are dangerous and toxic?

**DM:** Well, certainly in terms of wrapping these PFAS chemicals are widely used in pizza boxes, in anything where there could be grease and there's no question there is toxicity it causes. There are good human studies and animal studies that show immunological problems and among workers, increased kidney cancer, another import area, there's a chemical called Bisphenol A that's used in plastics, it's been removed for the most part from baby bottles, but still widely used in lots of chemicals. There are studies in China of workers who were exposed to this, which have very low sperm counts and sperm quality has gone way down. It hasn't been studied in the United States, I'd like to see it studied here more.

**LT:** And how about products like creams or lotions and shampoos, do those have toxic chemicals as well?

**DM:** It's interesting you raised that. There are lots of potentially toxic chemicals in cosmetics, and for many years, the Food and Drug Administration, which is in charge of regulating cosmetics really did nothing about them, they had a tiny office and never took on the cosmetic industry. Most recently, just legislation passed last month by Congress, increased the FDA's power, and I'm hoping that they will now start looking at these chemicals with a much stronger hand, begin to remove some of the world's dangerous chemicals from creams and shampoos and other cosmetics and personal care products.

**LT:** Because we know that we can give medicine through patches on the skin, it seems very clear that our skins can absorb these toxic chemicals as well.

**DM:** There's no question. People think that if you're putting a product on your skin, the government has certified it as safe, and certainly not true.

**LT:** What do you recommend for our regulatory review process?

**DM:** Well, we have to make our regulatory agency stronger and more agile. They have to be able to address issues much more quickly. Right now it's such a long process, and if you don't want to be regulated, there are so many things you can do to slow it down that we really need to change it. We

need to change this presumption of innocence. Right now, the agencies have to show that the chemical is dangerous and causing illness, which should be the other way around, it needs to be reversed, the requirement should be on the manufacturer to show that the chemical is safe. It will take a long time to get there, but that's really what we need to do.

**LT:** And how about regulating classes of chemicals?

**DM:** Absolutely, that's part of the same thing. We're never going to be able to do the studies on the 9,000 chemicals in this one category, these "forever chemicals". I think if we have good data on several of them, we should just assume that they are all potentially dangerous, that was the case in a petition that was given to the Consumer Product Safety Commission about flame retardants. And at the hearing, the chemical companies said, "You shouldn't regulate them all because we only have evidence that a couple of them are dangerous." One of the Commissioners of the Consumer Product Safety, Commissioner Robert Adler, who became the Chair, said to the representer of the chemical companies, "Can you tell me if you have any evidence that any of these are safe?" And the fellow from the chemical industry said, "I'll get back to you." It's five years now, they still haven't gotten back to him.

**LT:** David, before I ask for the 3 Takeaways you'd like to leave the audience with today, what else should I have asked you that I did not?

**DM:** Oh no, you've covered the waterfront. We could talk about these things for hours and hours, but I think we've hit the key points.

**LT:** Then what are the 3 Takeaways that you would like to leave the audience with today?

**DM:** The first is that manufacturing doubt has become standard operating procedure for so many corporations. It was used in tobacco and of course, in climate change by the fossil fuel industry, but it's used very widely by any industry that's trying to maintain market share, no matter how dangerous the product would be, number one, to recognize how widespread is. The second is to address that we need to change the evidence base, we need to make sure that research into the toxicity of these products is done by scientists who are independent of the manufacturers, but at the same time, the manufacturers should pay for the research. We need a system where they pay for the research, but don't control the scientists, because if the scientists are paid by a manufacturer, that would influence what they do. And the third thing I think is to end this presumption of innocence in regulation, we need to flip it over and say, "Let's not expose people to things unless we know they're safe."

**LT:** David, thank you so much for our conversation today, thank you for your wonderful books, and thank you for your service in government.

**DM:** My pleasure, thank you for having me on.

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