

Speaker 1 ([00:00](#)):

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Michael Taylor ([00:38](#)):

Hello everybody. This is Michael Taylor and Adam Roseman of the global law firm, Greenberg Traurig. Welcome to the next episode of the Workplace Safety Review Podcast. I am the chair of the GT OSHA practice group and I'm based out of our Washington DC and Northern Virginia offices. My colleague Adam is a member of the GT OSHA practice group as well, he is the co-host and he is based out of our Philadelphia office. To learn more about me, Adam or OSHA practice group please feel free to go to www.gtlaw.com where you'll find the information you're looking for. Today's special guest is Mr. Michael Jayjock. Mike has a Doctor of Philosophy in environmental engineering from Drexel University in Philadelphia, Pennsylvania. He has a Master of Science in environmental engineering also at Drexel University, Philadelphia, Pennsylvania and he got his Bachelor of Science at Penn State University in Pennsylvania. Mike is the sole proprietor of J Jack and Associates since about 2010. And Mike and I go back a long ways. We had a case a long time ago dealing with exposure to methylene chloride in the workplace. Mike, welcome.

Michael Jayjock ([02:06](#)):

Thanks Mike. I appreciate it.

Michael Taylor ([02:09](#)):

Mike has a long list of accomplishments that it would take the entire podcast for me to go through all of them but let me go through some of them. In terms of his professional committees, he's on the EPA Science Advisory Board, Scientific and Technological Achievement Awards Committee, he's also on the COVID-19 review panel, he's also on the Senior Advisory Board, Science Advisory Committee on Chemicals, Toxic Substances Controls Act peer review for EPA, draft Risk Evaluation for Asbestos and a long laundry list of other things. He has a particular interest in expertise in modeling the nature of indoor pollution by experimentally and theoretically characterizing sources and loss mechanisms. And Mike's here today to talk to us about human health risk assessments. Mike, what is a human health risk assessment?

Michael Jayjock ([03:13](#)):

Yeah. That's really... You said there was going to be a simple question, it really is. It's simply looking at a compound, when you're doing human health risk assessment in the context of compounds exposure, human exposure to compounds. It's looking at those compounds with regards to their inherent toxicity, one. And on the other side, looking at the actual exposure. So, comparing the potency to the exposure one can come up with an idea of what the risk might be. If you have a highly potent material with... It only takes a little bit of exposure to cause it to be risky, the classic example would be plutonium. On the other hand if you have a very low toxic material, think of oxygen, oxygen is toxic if you breathe pure oxygen for two days. Then, but you need a really high exposure to a low potency material. So the integration of those two, the toxicologists need the exposure assessors and the exposure assessor feed the toxicologists in order to do a risk assessment.

Michael Taylor ([04:21](#)):

Now, is this for chemicals that you're already aware of? You're trying to figure out if they deviated somehow, or is most of your work on newly discovered chemicals?

Michael Jayjock ([04:32](#)):

Well, the actual proactive approach to risk assessment is something that hasn't been done an awful lot in this country. It is being done over in Europe with what's known as the REACH program, where they literally are looking at all the chemicals that are in commerce and doing an exposure assessment and a hazard and toxicity assessment on them. So, but the reality is in this country and in my career, we would look at things that were known to be hazardous, things that were commercial poisons, pesticides and the like. Things that were shown in animal studies to be carcinogens, ethylene oxide, benzene so on and so forth. So, those materials are kind of brought to us and wasn't worked on very proactively. Now, task reauthorization is promising to look at existing chemicals but it's been a slow process.

Michael Taylor ([05:36](#)):

So it's something that, I think what you're saying is that the government hasn't mandated, if you will, either from a worker or public health perspective, but the companies when they have some of these dangerous chemicals will call you up and say, hey, can you do a risk assessment for us in terms of what we're using in the workplace, if you will.

Michael Jayjock ([05:58](#)):

Yeah. If they have a particular problem with a compound or a set of compounds that, they'll do that if they've anticipated. The whole action of anticipating is critical with that regard, many compounds were thought to be relatively safe until they wind up being unsafe. It was all a matter of the knowledge that you have of them.

Adam Roseman ([06:26](#)):

So Mike, let me ask you this. If an employer calls you up and wants your services on a risk assessment... I think as humans we all certainly understand, we all do risk assessments every day. But what does a, in your line of work, what does a risk assessment look like? What do you do when you get on site? Walk us through that process.

Michael Jayjock ([06:47](#)):

Yeah, well. I'm trying to think everyone is different, but if they're saying we... Many times I don't even go to the site. I'll just simply talk about the, get a handle on the inherent toxicity of the material. And in order to do that you need to, the best way to do it is to have an exposure limit. But of the... I was just looking at this today, there are 85,000 chemicals in commerce and only about a thousand of them have exposure limits, which meant that somebody looked at the toxicity and actually said, this is the allowable amount that you're allowed to breathe or intake during the day. I would look at how they use the material, whether it's buttoned up or in a more open process.

Michael Jayjock ([07:41](#)):

And if I were actually on site I would want to have some monitoring done to see what was going on in the air, to try to look at what the possibilities were for dermal exposure. Because with some compounds that don't have a lot of volatility or have a high molecular weight, they tend to be mostly dermally transferred and not inhaled. And some are just hand to mouth. Mike and I were talking about this yesterday, about a client he had with lead exposure, where he did all kinds of work on ventilation and

really buttoned it down well to the ventilation but, and the guys were not getting their exposure through dermal exposure, they were getting it through putting it on their hands and then having contaminated lunch rooms and then doing hand to mouth activity, of which we all do.

Michael Jayjock ([08:30](#)):

Kids eat dirt, a lot of dirt, and we eat about one tenth the amount of dirt the kids eat mostly from our hand to mouth activity. So, they are the sorts of things that you want to look at house, what are the possibilities for exposure and what might be the exposure limit. If you don't have an exposure limit, then you have to get creative relative to looking at the available toxicology and if there's no available toxicology on the compound of interest, look at a close surrogate from a structural activity standpoint. You would take a surrogate of, that had the same kind of benzene ring or whatever and if there was some data on that you'd do a kind of a read-across in order to get the, some idea of what the toxicity might be.

Michael Jayjock ([09:17](#)):

And you would default the worst case, you would... When I'm dealing with an aromatic compound I consider, that doesn't have any toxicity, I consider it as bad as benzene because it's probably not any worse than benzene. So they are the sorts of things you come at. You come at risk assessment from a precautionary approach but try not to be so precautionary you lose all credibility. So, and the other touchstone is that you want to trade conservatism for data. You're going to be precautionary, you're going to be conservative but if you start adding data to that to elucidate the exposure or to elucidate the toxicity, you can almost invariably raise a level of tolerable risk to that compound or raise the tolerable amount of exposure that would render a risk.

Adam Roseman ([10:08](#)):

Hey Mike, what is... We hear this all the time, we heard it a lot over the last two years obviously with the pandemic, but what is de minimis risk? What does that mean? And what, how do you measure that?

Michael Jayjock ([10:21](#)):

Oh, that's a great question. It really is. De minimis risk is basically, I think it's legal, basically that the law doesn't deal with trifles. And back... When you look at the benzene standard that, I think it was Justice Steven said, you'd have to be an idiot to worry about a risk of one in a billion but somewhere around one in a thousand might be a risk that would be, that would get your attention. But those, de minimis risk is just bad, it's sort of risk, it's so small that you don't worry about it. Now in the realm of occupational exposure, that risk is about one in a thousand for carcinogens but in the realm of the general public, that risk is about one in a million. So it's a thousand times more protective for the general public than it is for workers. And, but below that risk, it's considered truly a de minimis.

Michael Taylor ([11:25](#)):

Mike, one of the cases you and I had a long time ago was dealt with methylene chloride, as I mentioned previously, it was in a paint stripper and it was being used to remove paint off a concrete floor. And the question was basically, are the employees breathing in methylene chloride? And if so, to what degree, right?

Michael Jayjock ([11:49](#)):

Yeah.

Michael Taylor ([11:49](#)):

And you did some mathematical modeling to determine what that exposure level was and it turned out that you figured out that it had paraffin wax in it, which made the methylene chloride stick to the ground. And therefore wasn't in the breathing zone of the employee and you used mathematical modeling. Do you still do mathematical modeling for these types of compounds, but in particular, would you use that same kind of mathematical modeling when you're talking about airborne exposure to COVID-19?

Michael Jayjock ([12:24](#)):

Oh, yes. I mean, you let, you can have a pretty good idea of how much people are... There's a lot of research in this as far as what people are ejecting when they talk, when they yell, when they sing. Apparently singing really puts out a lot of particulate and the particulate comes along, if you're infected, it comes along with all these viable viruses. So yeah, you can and do model that. There are models out there online right now that you can calculate how many days it's going to take you, or how many hours it's going to take you to become infected. Because you'll know, there's an actual exposure limit for COVID virus that you would breathe in and and it's a function of concentration and time at that concentration.

Michael Jayjock ([13:12](#)):

So, that's doable with COVID. Going back to methylene chloride that was a really interesting subject in that, when I, first time I did it, all I did was a model and I assumed that the methylene chloride was evaporating from that product. And just as if you had thrown methylene chloride on the floor because I didn't have any idea otherwise as to what the effect would be of the chilling agent, the paraffin that was put in there. When I did that, it came out to be a pretty high exposure and, I don't know if you remember this or not Mike, but you actually paid out for the Pittsburgh testing to actually do some tests in which we actually spread it out in applied plate and measure the evaporation rate of the actual product with the paraffin. And that came out, in that test, to be much lower which allowed us to model and go to that particular administrative law judge and show him that there, we thought there was a much exposure.

Michael Taylor ([14:13](#)):

Yeah. You basically used math to determine if it was going to evaporate, how much and to what breathing zone and we were able to determine that the worker wasn't breathing in methylene chloride vapors. And it's-

Michael Jayjock ([14:30](#)):

Yeah. Not a real high amount, certainly not enough to warrant what his complaints were.

Michael Taylor ([14:37](#)):

Right. How-

Michael Jayjock ([14:39](#)):

Yeah. Go ahead.

Michael Taylor ([14:39](#)):

How is human health risk assessments different, if at all, for worker health versus public health. Public health could be ground contamination versus, use benzene example or lead in the air. How are the two risk assessments different, if at all?

Michael Jayjock ([15:01](#)):

Well, that goes back to the point of the standard of care. The standard of care in the environmental area is one in a million or sometimes one in a hundred thousand depending on just [inaudible 00:15:11] not exactly sure how, but sometimes it comes out that way. I think California uses one in a hundred thousand for public health and one in a thousand for the occupational area. So, when you have those sorts of standards of care, then you're going to have, you're going to have to be much sharper in determining the exposure for environmental exposures than you are for occupational exposures just because you have so much higher amount of the allowable exposure to be had. And the models are different, when you have groundwater coming into the, when you're drinking, most of the occupational exposures are not from what you would call far field sources.

Michael Jayjock ([15:56](#)):

They're literally up against the sources, they're breathing them in or they're putting it on their skin. And in those cases, like lead, they're actually putting it on their hands and then eating it but they're near field sources. And so, most of the time the occupational exposures near field, a lot of the concerns that the environmentalists have are the far field sources. The cars, the smoke stacks and those sorts of things and general water coming into the home and then people being exposed.

Michael Taylor ([16:28](#)):

So, are you basically saying that the risk tolerance for the worker is different in America than it is for the risk tolerance for the public?

Michael Jayjock ([16:37](#)):

Oh, yeah. And I don't think it's just America, I think they're wrestling with this over in Europe too and in other developed countries.

Michael Taylor ([16:45](#)):

So in other words you're saying, I think, is that we have more of an appetite of risk of worker injury to their health than the public.

Michael Jayjock ([16:56](#)):

Yeah. And well, with workers you're talking about folks that are probably at least 18 years old or probably less than 65. They have probably reasonable healthcare, they have personal protective equipment, they have some surveillance all of those things kind of factor in where you don't have it with grandma or the little babies or exposure to children. And these are the devils you don't know. These are exposures that are coming at people in the general public and they don't have any awareness, they certainly aren't getting any compensation for it. So that's one of, one factor. The other factor is, if you look at the actual risk of dying on the job in the United States, it's about one in a thousand and this is for lawyers and accountants. And if you're a fisherman in the Bering Sea, it's about a hundred in a thousand, it's about 10%. So it's, working is kind of risk, much riskier business than just living outside of the work environment.

Adam Roseman ([18:03](#)):

Hey Mike, in the last two years right, we've all had had to sort of do our own risk assessments right with respect to the pandemic. And help me, help us understand when you do a risk assessment, and we can take it into COVID context, do you factor in control measures like a face mask or social distancing as it relates to the risk associated? And again, I'm just relating it to COVID, do you factor those controls in when assessing risk for an airborne virus?

Michael Jayjock ([18:35](#)):

Oh, absolutely. I mean, these N95 masks are called that because they extensively reduce the pollution by 95%. So you essentially, you have one 20th of the risk of the exposure and subsequent risk when you have a really good mask on, when you have not such a good mask on, it's bad a factor of about three instead of 20. So yeah, and ventilation is critical. I mean, when you have air exchange rates with fresh air that are much higher, which are doing in schools now and the like, you've now really reduced the viral load and can actually talk about the amount of virus that you're guarding against, how long it might take to become infected even in high viral loads. So yeah, risk assessment really, and there has been an awful lot of work done on this as you've might imagine in the last couple years.

Adam Roseman ([19:32](#)):

[inaudible 00:19:32] Sure.

Michael Jayjock ([19:33](#)):

So, yeah. Now that's like a power alley for risk assessment.

Adam Roseman ([19:38](#)):

Yeah. No shortage of work for you in that space certainly.

Michael Jayjock ([19:42](#)):

Right.

Adam Roseman ([19:44](#)):

When you go though, when you go to a workplace and you do a risk assessment, what's the final product, right? Do you present your findings and then recommendations? What does that look like when you're going and meeting with operations and talking about risk?

Michael Jayjock ([19:58](#)):

Yeah. I've never written a risk assessment, I used to talk about risk assessments. When the exposure exceeds the exposure limit, the risk assessment has an unhappy face. When the exposure is much less than the exposure limit, then the risk assessment has a happy face. I've never ever written an exposure risk assessment that had an unhappy face. I go to the client and I say, look you have, there are issues here. You're going to have to, usually you can't do anything about the toxicity, but you're going to have to chop down the exposure, and here's how you chop down the exposure. And then once those things are in place, then you can write a report and you say, these are, this is the risk that extent within the area now. So yeah, it's, you wouldn't want to write a report that said, yeah you're dosing the daily sale your guys and, or girls and you have a serious issue here. So yeah, that's essentially it. The bottom line is

you make recommendations for ventilation, personal protective equipment with the assumption that they're going to be followed.

Michael Taylor ([21:11](#)):

Mike, how does age, race, socio-economic status impact risk assessments from a public health standpoint, if at all?

Michael Jayjock ([21:25](#)):

Well, I think that level of granularity is, mostly isn't there. Obviously, you're not going to have, most of the time, you're not going to have a reproductive hazard with men. It's mostly women and it's not only just women, it's women in a certain time of gestation, the first trimester is really the big deal with that. Age, again there are no exposure limits for 60 year olds versus 18 year olds. So I think they're, you tend to paint with a fairly broad brush relative to setting what we think are protective and then as protective as the ACGIH said, The American Conference of Governmental Industrial Hygienists, for nearly all people in the population,

Michael Taylor ([22:16](#)):

Do you compared to, you've been doing risky assessments for what? 30, 40 years? Something like that?

Michael Jayjock ([22:24](#)):

Yeah. Better part of 30 years. Yeah.

Michael Taylor ([22:27](#)):

Do you envision human health risk assessments to evolve over the next decade? And if so, how?

Michael Jayjock ([22:34](#)):

I really hope they do. I mean I've been, it's just kind of personal that this... Well, my whole career is pushing for industrial hygienists to use modeling more and more. Models are really the kind of the personification of the science of exposure assessment. If you, models help you to inform what the exposures are, they give you a lot of good information. So, the development and feeding of those models is going to take millions of dollars. I mean, is you can do it now at some level but to do it at a very high level is going to take some really good research. Same thing's going on with toxicology there, the EPA is coming up with better and better ways of doing toxicology for thousands of chemicals. And so I see that continuing to evolve as we go along.

Michael Jayjock ([23:28](#)):

But the real push is going to be political, that we decide that risk assessment is an important thing to do and right now it's kind of gotten some lip service relative to the task reauthorization. There's lot of it going on with regards to REACH in Europe but even there the models that they use for exposure, I think are really quite lacking. And I've been a member of a group that's really been trying to challenge those models and to get the sort of research resources that we need in order to do a better job of [inaudible 00:24:06] exposure.

Michael Taylor ([24:07](#)):

Yeah. I mean, as you know, OSHA has an airborne contaminant standard and it lists all the chemicals with permissible exposure levels that haven't been updated since the 90s, right?

Michael Jayjock ([24:20](#)):

No, the 70s.

Michael Taylor ([24:20](#)):

70s. Yeah. The 70s.

Michael Jayjock ([24:22](#)):

Yeah. Late seventies or early eighties, I think. Yeah.

Michael Taylor ([24:25](#)):

So, without doing these human or these risk assessments, we're never big, we're never going to be able to determine what the appropriate PEL level is today, which may be greater or less we just don't know. And it, as you were saying, it's going to take some push for government to work with the industry to say, we've got to do this so that we can be in the 21st century.

Michael Jayjock ([24:53](#)):

Yeah. Well, the American, the ACGIH, American Conference of Governmental Industrial Hygienists actually does a real good job of setting up exposure limits. And when you compare them to the PELs, you can see what happened in the last 30 or 50 years, that the exposure limits have gone down and the documentation of those limits have gone up. So it's, so we do have that right body that is putting out these exposure limits. And I feel I would feel much better about an ACGIH limit than an OSHA PEL that's ancient.

Michael Taylor ([25:33](#)):

[inaudible 00:25:33]

Adam Roseman ([25:33](#)):

Hey Mike, last question for you. Do you think just sitting here today that our experience through this pandemic, just put aside any politics or anything like that, do you think this will have a Net Positive Impact on public officials and others to really invest and engage in risk assessments like we've been talking about? Do you think that will be a push in the future? Or do you think we've lost, we've sort of come out of this and revert back to where we were a couple years ago?

Michael Jayjock ([26:03](#)):

Well, I think there's always that tendency to think that this is over then let it be but now I truly think that we've learned some lessons here. I mean, this has been incredibly costly from a human perspective or children getting nailed in school or all the things that, and just the dollars and cents, I think relative to infectious disease I think we're really up on, we're going to have our game up. These mRNA vaccines were just absolutely amazing, they're going to continue to push that particular technology. So no, I think this is going to be an awakening relative to infectious diseases whether that carries over to chemical exposure assessment is another matter and my sense is, unfortunately not.

Adam Roseman ([26:58](#)):

Yeah.

Michael Taylor ([26:59](#)):

Oh hey Mike, thank you so much for being on the show. It's a pleasure and stay tuned for the next episode of the Workplace Safety Review Podcast.