

**3M Transcript for the following interview: Ep 69 Nigel Johnson, Lead**

Mark Reggers (R) Nigel Johnson (J)

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Welcome to the 3M Science of Safety podcast presented by 3M Australia and New Zealand Personal Safety Division. This is a podcast that is curious about the signs and systems of all things work, health and safety, that keep workers safe and protect their health. I am Mark Reggers, an occupational hygienist, who likes to ask the questions Why, How, and Please Explain. Whether you are a safety professional, occupational hygienist, or someone with any level of WHS responsibility in the workplace, maybe you are a user of safety products or maybe you are a bit of a safety nerd who finds this stuff really interesting, then this is a podcast for you.

Today, we're talking all about lead with Nigel Johnson. Welcome, Nigel.

(J) Thank you very much, Mark and great to be here.

(R) Well, can you please introduce yourself, who are you, where are you from and a little bit about what you do?

(J) I'm Nigel Johnson. I'm a licensed asbestos assessor. I've been a consultant for about 15 years and also managing director of a consultancy called Property Risk Australia. And currently, the president of a newly formed group; the Asbestos and Hazardous Materials Consultants Association.

(R) So, you've come across lead in your travels then, I take it.

(J) I have. I've taken many, if not thousands and thousands of lead samples

(R) Well, before we get too deep into that, let's start with the basics. What is lead?

(J) Lead is a heavy metal, it's in the earth. It gets mined and processed and put in a range of different things.

(R) Where would you find lead? I mean, today as far as products or locations from a workplace risk point of view.

(J) Look, it's not just even workplaces. If you start thinking where was lead used and still used today, Car batteries have lead in them. Bullets, sinkers that people use.

(R) You're talking about the fish sinkers, yeah.

(J) Yeah, and even some toys actually were made purely out of lead which kids used to play with which you start thinking about and you start looking at health risks associated with lead, it's not a really good thing. But in this day and age, probably the two main ones that stick out are lead in paint, which is from historical uses, And the other one is lead in dust and or soil, from once again, historical uses from lead being put into petrol in cars and over time, lead was deposited within the dust within ceiling spaces and other areas, including soil.

(R) So, would it primarily be tradespeople ... you talk about paint and once again settling in ceiling spaces ... that would be most likely to be exposed and have lead exposure today.

(J) Yeah, look, there's lead still used in quite a few manufacturing processes. They tried to, back in the '70s, lower the levels of lead in paint. It was reduced from around about 20% in the '70s down to 1% and in the '90s, they reduced that further to about 0.1%. So, lead's still in some paints and lead chromates as well, which is a carcinogen. But yeah, there is lead in different forms, still within paints to a certain level.

(R) And we still do have lead mining in Australia as well.

(J) We sure do.

(R) So, you're going to have those workers in that environment with lead exposures. So, when you talk about the health risks associated with lead, what would some of those be and what is the most common route of entry when we talk about lead and exposures to workers?

(J) Well, lead, I like to say, has got the trifecta; ingestion, inhalation and absorption through the skin. So, inhalation yes, is a pathway into the body, probably the easiest way. Absorptions through the skin, to a lesser extent, depending on the process. Ingestion is particularly important, especially with kids. Kids don't necessarily know what paint is or they tend to pick off stuff and put random things in their mouth.

(R) I have a newborn and everything goes in the mouth, so I can appreciate from a kid risk point of view, if it's getting on the hands, there's a very high potential we know where it's going.

(J) Absolutely, with paint in the older houses, because it's such a high percentage, potentially the lead in the paint, it's quite important that you do, know whether it's in the paint and also potentially keeping your kids away from it as well.

(R) So, what are those health risks associated through these routes of entry into us, as humans?

(J) Yeah, look, health risks and health effects from exposure to lead comes from a variety of different factors and it does depend on the person's age, the amount of lead they've been exposed to and how long and ultimately, the health effects associated with that. Lead does store within the body and it stores within your blood cells. It stores within your bones and ultimately builds up over time. It can affect intellectual development, especially in kids and brain development. High levels of lead presented in the body can lead to convulsions, coma, death and there can be harmful effects on the central nervous system and brain.

(R) So, there's a whole range of not so nice things that could happen, so we do want to prevent those exposures to workers and people.

(R) So, I'm a workplace and we just spoke about lead and all these different potential products and locations. Where does a workplace start to determine if they may be getting exposed to lead and how much there may be in their workplace?

(J) Well, with a workplace, it depends if we're talking about lead paint and or lead, airborne lead. So, from a lead paint point of view, where it gets drawn into is a part of legislation, especially with hazardous building materials. Hazardous building materials including asbestos, lead paint, PCBs, SMF, ozone depleting substances and lead gets drawn up in part of an Australian Standard, Demolition of Structures and also a Demolition Code. It's about identifying risks associated with lead paint and or lead dust within ceiling spaces. So, identification during that phase where workers at risk during the demolition works is very important. So, taking samples to determine one, if lead is present and two, the concentration of the lead within the particular material, whether paint or dust, is particularly important as well, and that's all based on risk; risk of exposure, risk during that demolition phase of any project.

(R) As I mentioned, and on most of our podcasts, it starts with that risk assessment and identifying what are we potentially doing, being exposed to and what are those levels to prioritise that. So, you mentioned lead in air. So, can you do air monitoring? Is there an exposure standard around lead that people should be aware of?

(J) Yeah, look, in April 2018, the exposure standard for airborne lead dropped and it dropped significantly by two thirds from 0.15 milligrams per metres cubed to 0.05 milligrams per metres cubed ...

(R) Big drop.

(J) Which is a really big drop. So, the impacts on industry, one, lead process or mining with airborne lead and also lead paint removals or lead dust removals. The true impacts of that to the workers is not quite known yet because the exposure standards got such a significant drop, I think a whole bunch of exposure monitoring and different activities in workplaces I think is warranted to make sure that people aren't unnecessarily exposed above that exposure standard of 0.05.

(R) And that's what I always talk about on the podcast, that ALARP principle, as low as reasonably practical. We should always be trying to bring that exposure down as low as possible not, "Oh, let's just get it just underneath the exposure standard," whatever that exposure standard is because we know, as we've discussed many times in this podcast, that is not a line of safe and unsafe. So, we're trying to bring it down as low as possible. So, yes, that number's dropped, it still shouldn't change the fact we're trying to do as much as we can to prevent those exposures.

(J) And look, with lead, because it builds up in your body over time, measuring blood with workplaces that do have lead or you work with lead, it's important you monitor the blood levels of workers working with lead and that, in a nutshell, sits under the work health and safety legislation and those levels are pre-prescribed. You need to meet those and if you're above those certain levels, you need to take the worker out of that situation where they're being exposed to lead for a period of time, until their blood levels get down low enough.

(R) We did do a previous episode with Julia Norris about health workplace monitoring about that and checking your bloods and that biological monitoring is a confirmation that your controls are working or maybe they're not working, and then to make the appropriate courses of action to rectify that, so important stuff.

(J) Look, it's quite interesting. I've been working with contractors removing lead paint recently and with the change of the Airborne Exposure Standard, they were not focusing on that at all. They were actually focusing mainly on the bloods. So, they kept saying their blood levels are okay, and we're going, "But the airborne

levels are not. You need to meet both the exposure standard for airborne and also the blood levels."

(R) And that health monitoring is an important part but it's a bit more of a lagging indicator. It's after the fact that exposure has happened, so we've got to bring it up to the front end of things with that airborne monitoring to try and prevent the exposure in the first place, rather than allowing exposure and then checking that it was okay. I want to make sure that's the right way around there.

(J) Absolutely right.

(R) Where does wipe sampling come into it? Now, I'm assuming that's not for checking a worker's exposure, but how is that used in many workplaces?

(J) So, wipe sampling is a good way of determining settled dust using a wipe sample does allow you to test something that you can't see or can't physically take a sample of like a piece of paint chip or a piece of lead that you might know that's lead, to know a percentage.

(R) So, there's been some remediation or repairs. We're able to use a wipe sample to check that whoever's done the job hasn't left contamination. It's a bit like a clearance certificate in a way, to be able to reoccupy a space without that concern of, "Gee, maybe there's lead contamination everywhere."

(J) Yeah, look, so wipe sampling is one method of taking samples for dust and that's measured in milligrams per metres squared. And there's also another way with bulk sampling for settled dust, which is sampling in milligrams per kilo. Quite different methods and different reasons for sampling.

(R) The objective to see how much lead, if there is lead, and proceed with the next course of action.

(J) Absolutely.

(R) So, I just wanted to focus in on lead in paint, because I think for a lot of industries, that is going to be their primary exposure. So, why was lead added into paint in the first place?

(J) A few different reasons actually. One, it dried quicker with lead in the paint, two, durability, so it would last longer and also weathering, so obviously in external environments, the paint lasted longer. Although it's not quite mentioned in some of the standards about lead paint in respects to why it was put in, I've found over the years through sampling that plant rooms and some of those industrial settings, especially where the plant and equipment is in high rise buildings, lead paint seems to be within those parts of the building as well as a lot of the metal structures throughout the building as well.

(R) The reasons you just highlighted for adding lead would all be very desirable characteristics in qualities of a product if you were a paint manufacturer. So, today, if I'm going up and I'm looking at a plant room, as you used an example, how would you determine if paint contains lead and how much lead?

(J) There's two ways to sample lead paint. One is using XRD, which is x-ray, which is literally pointing a gun at the material ... it's usually a wall or a skirting board or something of the like. And that particular method, it's a tricky one to use. It gives you an indicator I'd like to say, whether lead's within the paint, but not necessarily getting down to the pure percentages because when you're using that method, you have to physically take a sample off the wall, measure the thickness of the paint, then determine the parts per million based on that particular material. It's quite hard to get down to the exact amount. But there is another method which I would prefer to use which is ultimately a percentage-based lead in paint, and that's a 50 by 50 millimetres of paint you would scrape off the wall or skirting board or the like and you'd send it off to a laboratory. which is NATA accredited to test for lead content, and that'll give you a percentage by weight,

(R) Is lead paint still allowed in Australia today or what do you do with that percentage of paint? Does that help determine when something is classified as lead paint or not as lead paint?

(J) Yeah, there's two Australian Standards in respects to lead and one more importantly lead in paint. And that actually has changed. I'm not necessarily sure whether it was because the Airborne Exposure Standard changed and lowered in 2017. So, what was considered lead paint before was 1%. Now it's dropped to 0.1% which is a huge drop. So, some of those buildings which I've surveyed over the last 15 years which we used to say was below 1%, but above the 0.1%, is now considered lead containing paint. So yeah, it's quite an interesting one. So, you've got a lot of those buildings where we were saying it was not lead paint, but it is lead paint now.

(R) That just highlights things change and to treat things the right way, as low as reasonably practical from an exposure point of view, but also from a management point of view. So, let's say I'm a building owner and I've got some old buildings and we look at the hierarchy of control management point of view, what are the things that workplaces should be looking at, considering to manage this risk of lead paint in the workplace?

(J) So, the hierarchy of control quite simply, elimination is the key. However, elimination can mean a range of different things. Substituting certain materials; lead still is in paint to a certain extent, in certain materials, especially imports from overseas. So, making sure that the products you're getting, try to limit the amount of lead that's within the paint and try not to work with it. So, elimination. But also, you can encapsulate lead paint. So, by simply painting over lead paint, especially a residential home ... you can't strip a residential home of all its paint if it's got lead within the paint, but simply painting over it could encapsulate the paint.



(R) Do you need to keep that on a register to know that it's there, because at some point down the track, somebody may be doing some maintenance and it would be good information to have.

(J) Yeah, look, this comes back to those standards and work health and safety laws, and making sure that you're identifying risks associated with any site or any workplace. And some of those risks associated with those workplaces is all those hazardous materials, as I said before; asbestos, your lead paint, PCBs, your synthetic mineral fibres, all those things. So, there's laws around having asbestos registers but having a hazardous materials register is probably the better way to go.

(R) It's hard to manage something if you don't know where it is, so having that register because it's that starting to go, "Yes, we know where it is," and so part of that planning stage of work before we send a contractor to do a thing, we know that lead may be there and to put the right things in place.

(J) Yeah, and the work health and safety legislation and the Australian Standards of Demolition of Structures and Demolition Work really spell out you need to do your due diligence prior to renovation and prior to demolition. So, prior to renovation can mean when a contractor's going through your property to do some work, so you should be trying to have a look at those certain things or certain risks associated with especially lead paint and asbestos.

(R) What other things can workplaces do to manage those lead risks as we work our way down the hierarchy of control?

(J) So, thinking about other ways to controlling potential exposure to lead; the number one thing is good hygiene practices and what does that mean? Well, I think earlier on the exposure pathways to getting lead into the body is ingestion so eating it, inhalation so breathing it in and also through the skin. So, thinking about it logically, good hygiene practices by keeping yourself clean, so by wiping your hands or when you're working with lead and keeping your hands clean especially

and making sure you're cleaning them after any activity because then you go and eat and it transfers onto your food and you ingest it.

(R) I was just about to say, that hand hygiene and the handwashing is so crucial, whether it's lead or other type of things, the hand always go to the mouth or maybe cigarette smokers, it's going on the cigarette and putting in the mouth as well.

(J) Absolutely.

(R) And fingernails as well.

(J) Absolutely, yeah, so good hygiene practice is very important as well as wearing respirators, so making sure you're wearing the right respirator what you're doing; not just lead. And minimise how much you get into your body ultimately, the same as any contaminant.

(R) You mentioned before gloves and coveralls and so on. As you said, it's got that three routes of entry so you want to cover, protect those routes of entry to prevent that exposure.

(J) Sugar Soap is a good thing to use. We use it in between sampling of wiping down tools and equipment to make sure there's no cross contamination when sampling, making sure things are clean.

(R) So, we've talked a lot about workplaces. What about from a residential point of view? You see some of these older houses and you can see the paint flakes literally peeling off and all it's going to take is a windy day to blow a lot of this stuff out. Is it a similar approach to the residential to the workplace side of things?

(J) A lot of it does sit under the work health and safety legislation but where, the paint flakes get drawn into is mainly around the EPA. So, lead paint actually leeches into the ground, so the importance of making sure if you do have lead paint lying around your property that you get rid of it promptly. It may not, on a residential dwelling, be quite a big issue but definitely in an industrial or

commercial setting could become a big issue from an environmental point of view. And lead paint, under the EPA's Waste Classification Guideline is considered hazardous waste. So, it's very expensive to remove hazardous waste. So, if you're getting your soil then classified as hazardous waste because there's lead paint flakes within it, it's a very expensive exercise to get rid of that soil.

(R) Hence controlling things earlier in the process, not letting things go until they're literally falling apart, but maintaining properties, and that falls under the facilities maintenance world of things to keep on top of it to prevent further, more maybe costly issues down the track.

(J) And look, a lot of those older buildings too, with some of the highest concentrations I've seen of lead paint of the buildings that I've surveyed, they tend to be those heritage listed type buildings. And there's so many layers of paint. I think the most I've ever counted was 19 layers of paint, over, painted over, painted over, but the actual painting over it, because they're painting over it so often is actually really good. It's encapsulated, so it is a really good option in some cases just to simply paint over the paint, if it's not flaking off and going everywhere.

(R) And being aware that it is there to manage with other tasks of course as well. You mentioned some Australian Standards. Can you detail which ones they are specifically for our listeners.

(J) So, there's two Australian Standards for lead paint. The first one is mainly aimed at industrial applications and it doesn't just cover off lead paint. It also covers off some of the other heavy metals as well like arsenic and cadmium, the chromates as well. So, it's really around in those industrial settings around managing the lead in situ, not necessarily around the removal side of it. It does touch on it, what you need to do but, it's around about managing. There's another one which is for residential and commercial buildings and that is also about management of lead paint but it does get into public spaces and public buildings as well. It gets right into the detail of sampling and methods and, a whole range of different things.

(R) And they're Australian Standards AS4361.1 and 4361.2 for those wanting to look them up online. Now, to sum up, lead as a hazard and in different workplaces, what would be the key message you'd want to leave with our listeners today?

(J) Making sure you have samples of a property that you think's got lead within it, especially if you've got small kids around, I think is quite important in the residential setting. I've got two small kids as well and knowing whether my house had lead paint. I actually did sample and my house actually has asbestos as well and I did sample to make sure and I am a licensed asbestos assessor. So, the only way to actually to determine that is by sampling that and taking it to a NATA accredited laboratory. So, taking samples is one thing. In a workplace, there is an obligation there prior to renovation, demolition to identify the hazardous materials and hazardous building materials and lead being one of those. So, once again sampling it, knowing your percentages and determining whether it's lead paint or not.

(R) It comes back to knowing if the hazard is present or not present and to what level, so you know what you need to do about it going forward.

(J) Yeah, so, a good practice would be prior to any renovation and demolition works is to do what's called a destructive survey or a demolition survey and that is going into the details of looking specifically at the activities that the contractor's trying to do and in some cases, the renovation might be literally knocking one wall out of a building, but knowing whether there's lead in the paint or asbestos or any other hazardous material. Doctors' surgeries for example, have lead-lined walls where they do x-rays. So, lead could be there in a number of applications. So, determining whether there's lead there is important and those pre-demolition surveys really do identify those hazardous building materials prior to the works happening.

(R) So, where can our listeners go to get more information, because we really have touched on a couple of these key areas, but only in a short period of time? Where would you recommend?

(J) Look, EPA have quite a lot of useful documentation around lead and lead paint. SafeWork have a lot around that. Australian Standards, the AIOH, the AHCA, our new industry group. Yeah, look, there's information out there with lead. And look, lead in respects to Australia, we're getting on top of it. The Americans actually have a lot of information on lead and Australia tends to follow suit. Australia has probably less resources than America has and they've researched lead extensively. So, some of the stuff that we've got does follow from the Americans, so there's quite a lot in respects to lead from America, but also in Australia. We've got new workplace exposure standards, so you can go to SafeWork Australia.

(R) And if people want to get in contact with yourself and Property Risk Australia, if they want some help in the workplace when you start talking about some of these assessments and monitoring, what's the best way to do that?

(J) Yeah, look, if you want to find me, you can find me through either the Property Risk Australia website, which is [www.propertyrisk.com.au](http://www.propertyrisk.com.au) or you can get me on [www.ahca.org.au](http://www.ahca.org.au).

(R) And that is the new association you mentioned before?

(J) It is. Yeah, look, there's a whole bunch of us, mainly licensed asbestos assessors and hazardous materials consultants that have been in the industry, a long time. So, it's pulling all us together as a group to give back, to the industry.

(R) And that AHCA is the Asbestos and Hazardous Materials Consultants Association.

(J) That's right.

(R) Well, thank you so much for your time today, Nigel. Thanks for coming in.

(J) Thank you, Mark. Cheers.

(R) Well, thanks for listening everyone. You can get in contact with the show by sending an email to [scienceofsafetyanz@mmm.com](mailto:scienceofsafetyanz@mmm.com). If you have any questions, or

topic suggestions or you'd like some assistance in your workplace when it comes to lead PPE, 3M are certainly here to help. You can also visit our website, [3m.com.au/sospodcast](https://3m.com.au/sospodcast) for further resources on lead, as well as a transcript of the chat Nigel and I have just had. Be sure to subscribe and share through Apple Podcasts, Spotify or Google Podcasts or wherever you get this podcast from. And as Paulo Coelho said, "The world is changed by your example, not your opinion." Thanks for listening and have a safe day.