3M Transcript for the following interview: Ep-6 Kate Cole, Silica Part 2

Mark Reggers (R) Kate Cole (C)

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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.

(R) Are there other factors that impact these particular diseases, I mean you've got silica dust, but are there particular things that workplaces should be aware of?

(C) Definitely, so the toxicity of silica dust increases when you are working with freshly fractured silica or freshly fractured rock. So, for example, the toxicity of silica dust will be higher in construction involving tunnelling through sandstone or other rock that is freshly fractured as opposed to dealing with aged silica such as cement and concrete which has been exposed to the air before, and has gone through a manufacture process, and then it is being broken up again. It doesn't mean it is any less important, they are all important, however it does affect, whether or not it is aged or freshly fractured, does affect the level of toxicity that is posed to the worker.

(R) So, if you are working and you've got the freshly fractured dust, obviously you are probably at a higher risk rating, you are still obviously going to be obviously something you need to do about it [C: Yes]. For a workplace, how would they know how much a worker is being exposed to, you've mentioned exposure standards, 0.1 mg per cubic metre and lower in other countries, but how do I even know what that level is for my workers?

(C) Well, the only way to truly know is to measure it. And that is where occupational hygienists get involved. Measuring silica dust is not something that you can, you know, go to Bunnings, get a monitor, and bring it to your site. Unfortunately, not that simple, but it is not overly complicated either. So traditionally occupational hygienists will come to a project site, they will attach a small pump onto a worker's belt, kind of like a puffer size, it will have a little tube that will go up to the worker's collar where it will be fitted to a cyclone, and it will suck air in through that cyclone at a standard rate for around an eight-hour period. That dust is captured on a filter and based on that, occupational hygienists can determine how much silica dust that worker was exposed to over that period of time. I mean, the technical things behind that is that, you know, the filter goes through the ……, there is an Australian standard that is used, etc, but ultimately what the worker would see is someone attaching a pump to them and then the pump goes away and then around a week or two later getting the results back from the lab and understanding how that exposure relates to that exposure standard.

(R) So, they do that comparison. If my workers, or I've got a workplace where my guys have already been exposed, is there any way to see if they have been affected, or may be going to be affected by silica exposure?

(C) So, all workers that are at a significant risk of exposure to crystalline silica should be undergoing health surveillance or health monitoring for crystalline silica,

and if they haven't already then, they should be sent for health monitoring for crystalline silica, and that can be done by any medical provider. One that is commonly used in the state of New South Wales is icare which I guess is the old dust disease board, and icare has some clinics in the city and they will do health surveillance for silica which will include things like lung function tests, a chest x-ray, and general history on exposure. And I guess some of the challenges with that is that you are looking at past exposure and the latency period may not be realised yet, however I never think that health monitoring is a waste of money, it is always a good thing to do, particularly if workers are concerned, then it is a great way of understanding where they are right now. But that is just looking at latent issues. If there is a concern in the workplace then the first thing that should be done is, what are the reasonable steps that we can take to reduce exposure, let's do them right now, and then let's monitor to see how effective that has been to see if we have to do a bit more.

(R) It's a key point, it is a lagging indicator, it is after the fact that exposure has happened but still part of the overall program to know how effective those controls are actually being. So, if I'm a workplace, and I want to find out more about what I need to do, where would I go to find information on silica and silica controls?

(C) There are quite a few great resources out there at the moment. Probably the first place to go to would be the Safe Work New South Wales website. Safe Work New South Wales have silica as one of their top two hazardous chemicals of focus as part of their hazardous chemicals and materials baseline exposure reduction strategy. That's a lot of words, but essentially it is very important to our health and safety regulator at the moment which is great news. So there are some technical fact sheets and some guides on the Safe Work New South Wales website. There is also a lot of publicly available information from international sources. One really great one is the Breathe Freely campaign from the UK which can be easily found on Google, and there are some great toolbox talks and some information, general

information about controlling silica dust. And of course, engaging an occupational hygienist to come into your workplace to assist you will really help you understand what is going on in your workplace, and specific things that are targeted to what you are doing. That would be a great thing to do.

(R) And given such a priority in the health effects, I mean it's a bit of no-brainer, there are so many resources that are freely available in Australia from all different state regulators, Safe Work Australia and those international ones, so get on Google, do some searching, and there will be plenty of information that will come up. So, I've done my monitoring, I've got my occupational hygienist to come in, and I've got some high results. What is the next step for workplace to go, all right, what do I do?

(C) I think the first thing that you need to do is to inform the workers of what the levels of silica dust are. So, get a group together, explain what has happened, how high it is, and then actually consult with the workers and involve them in the choice of how do we actually control it. And of course, the first thing you do is you go to elimination, so are you using high quartz products that you don't need to? The next would be substitution, you know, can you substitute your high quartz products with lower quartz products? So, could you substitute manufactured stone with marble for example? Um, and unfortunately in construction generally neither of those two things are practicable, so we tend to go into engineering controls, and at that level we are looking at, you know, local exhaust ventilation, so on-tool dust extraction for example. We are looking at dust suppression, so that is focused on the source of where the dust is being generated rather than looking at secondary exposures. And then down to administrative controls, so really good awareness training so workers understand where those sources of silica dust exposures are coming from. Can we reduce the shifts or the areas where the workers are being exposed? So if a worker is doing a particular task that results in high silica dust exposure for eight hours, could they actually spot that and reduce it down so that half a shift is

performed doing this activity and half a shift is performed doing a different activity, for example. And then of course down to what we would call the lowest common denominator which is personal protective equipment, however that doesn't mean it is any less important. And even though it is very low on the control hierarchy, actually the use of PPE, in this case respiratory protection, can be a very effective way of controlling exposures to be below the exposure standard for short-term tasks.

(R) That's got to be a common theme within most of our podcasts when we do touch on the PPE that if it is required, because we can't control it at a higher level, you've got to make sure it works. It genuinely is that last line between an exposure or an event, so I guess I get frustrated when I travel around and see that, Oh, it's PPE, oh, he's got it on his head or in his ear, that's fine, but it is actually performing, so I guess what I'm trying to say is the effectiveness of the PPE really relies on the worker and their attitude and their understanding of why they're having to wear that which goes back to that awareness training.

(C) Yeah, I would say it's twofold. It is the workforce but it is also the leadership of that particularly project, so some of the best projects that I have worked on which have had fantastic PPE compliance have been those projects that have engaged their workforce in a consultative way and said, look, here's a whole bunch of different types of PPE that we can use for this task, let's sit down and go through what you would like to wear for that particular task. Get buy-in from the workers so they are part of that decision-making process, because these are the people who are going to be wearing it for a significant portion of their day or their work on this particular project. And by doing that, you get better uptake and you get a better understanding of the limitations of maybe one model over another, because there are other considerations, as you would know, for using PPE, it is not just about is it the right, you know,
P class, is it P1, P2, P3...

(R) You're talking particulate filters there?

(C) Particulate filters [R: Yep] but is it going to restrict by field of vision which then may create additional health and safety risks, particularly if the worker's job involves working near heavy machinery, for example, that is moving in their sight. Is it going to make the worker hot, is it a full-face respirator that is going to, you know, be really difficult to work in for a long period of time? So there are a lot of other considerations and by involving the workforce in that decision, and that really comes from leadership at the project level, you get a much better outcome and therefore better compliance, and therefore it is going to work better and actually reduce those exposures.

(R) Another key factor is communication is probably another real big one with any PPE, you can't communicate to your co-worker or can't hear other sounds depending on what that PPE is, so fantastic points. And I really wanted to highlight some of those engineering controls, and you think about angle grinders or you know, the circular saws, having on-tool local exhaust ventilation is such an easy, accessible tool that is going to prevent that stuff getting in the air.

(C) Definitely. I guess going back to our previous conversation, to a previous point on the workplace exposure standard and how small it is, we still find as occupational hygienists that even though we have situations with really good engineering controls, like on-tool exhaust extraction and dust suppression, we are still needing to recommend the use of respiratory protection to reduce exposures because that workplace exposure standard is so low. But what engineering controls do is reduce the worker's reliance on PPEs, so it can be a lower level of protection. So for example rather than using a full-face powered air purifying respirator which can be quite cumbersome in certain tasks and activities, and also quite prohibitively expensive if you have very large volumes of workforce, instead

of looking at that you can actually use fantastic engineering controls and use a lower grade, or lower level, of respiratory protection like a disposable dust mask or a re-usable half-face respirator, or things that generally are more palatable or easier to use from the workforce's perspective.

(R) Talking about particulate filters, what level of particulate filter would someone use for silica dust?

(C) Um, you can use a P1 for example, however I will say that the most common type used in the construction industry in my experience is the P2, for many reasons. One includes, to get off topic a little bit, one includes the fact that workers are traditionally exposed to many other occupational health hazards not just one in isolation, so some workers are also exposed to thermally-generated particles like diesel particulate matter. And by using a P2 respirator you are controlling exposures or reducing exposures to both silica dust and DPM at the same time.

(R) Just for our listeners, so P1 is for mechanically-generated particulates, so grinding, drilling, sawing, and P2 is for mechanically and thermally-generated particulates, so when we start talking about thermally-generated particulates, usually there is more energy, so the size of the particulate from that activity is going to be smaller, so the P2 is rated to a 94 percent efficient, and in another podcast we delve into that, but I just wanted to skim the surface of that P2, as you say, it is going to be great for other workplace hazards before going up. What about housekeeping, how does housekeeping play in a work site or in tunnelling as far as affecting those exposures?

(C) Housekeeping is incredibly important, and unfortunately poor housekeeping is one of the highest risk areas of silica dust exposure, and I guess some really good examples would be the way that constructions might clean up, so a crib room and a crib shed will involve having muddy boots tracked into that crib shed, and over

time that mud dries out and then cleaning crews come in and start to dry sweep up the floor of that crib shed. And, unfortunately, what is happening is that silica-laden mud becomes silica-laden dust which is then distributed up in the air, and that is a key source of exposure, even going into the crib shed. That could be prevented by using wet methods, so a wet vac or mopping rather than dry brush sweeping. Another area of housekeeping which is really important is the way that we as an industry maintain our heavy plant cabins, so the floor of an excavator or the floor of a dump truck, for example, will have the same problem, the worker's muddy boots will dry out, the air conditioning will dry it out, and then every time the worker gets in they will kick up that dust which will then stay in that cabin and be a huge source of silica exposure. As well, fabric seats which every time the worker sits on that fabric seat will liberate that dust again. And these can be reduced by using wet methods to clean out the cabins, and also by using leather seats or plastic covers over the fabric seats to reduce the amount of exposure.

(R) This all sounds like fairly simple ways to get around that providing you are aware of that is actually going on. I guess that goes back to right at the very start, understanding what is the hazard, where those potential exposers happen. If we know where it is happening we can do something about it, it doesn't have to be too much more complicated than that in theory, I know in practice, but if we know what is going on we can do something about it.

(C) And generally, that is one of the challenges with silica dust control, is actually raising the level of awareness of how big of an issue this is, because as you would be aware, every construction site generates dust in some form, but this is not just dust, this is a carcinogenic toxic dust. So how do we all work together and raise our awareness collectively across the industry, to go, well, I know that you've been working in this stuff for a bit, and I know this may have happened on the job before and the job before that, but there is still opportunity to change and to do better, and there are a lot of simple things that can be done to reduce exposures.

Unfortunately, there is no one silver bullet. There is no one thing that can come in and control all exposures to silica dust. It Isa Woermann-Dreyer multifaceted strategy from engineering to administrative controls, housekeeping, all the way down to PPE, but they are all as important as each other.

(R) Is this like the weakest link, if one of those controls is not effective that is going to affect everything else and what controls you are actually selecting.

(C) Definitely.

(R) So as part of your Winston Churchill Fellowship, you did some traveling across the world and .... you put out a fantastic report. If anyone is interested, that can be found on Google. I've got your report here and I want to read out something here, on average over 250 workers in Australia die from an injury sustained at work each year. Well, that's not very good, but by comparison over 2,000 workers die from work-related illness. So I guess I wanted to read that out because that sort of puts in perspective the importance, so look, you know, if there is a safety fatality which is not great, but there is way more people unfortunately that are passing away from those chronic illnesses over time, which I wanted to bring up because I feel that puts that in perspective, everything that we have been talking about on why those controls are so important, and what is preventing those illnesses and fatalities down the track.

(C) That's a really good point, and what I found from traveling to all these countries was that absolutely, our safety standards in Australia are proudly very, very high, and it is fantastic to work in a country that places such importance on safety. We have fantastic symptoms in the T1 construction industry around, you know, working with electricity, people/plant interaction, fall from heights, we have all of that and it is great. I am not suggesting for a moment that that should be diluted or taken away in any fashion, if anything we should just continue getting stronger at those

activities and our focus on safety. However, internationally I found that our health standards by comparison, we are very low. [R: Wow]. So, other countries like the US, Norway, Switzerland, they have a lot of really good focus on the importance of occupational health and preventing exposures that lead to disease, whereas in Australia I feel that our main focus historically has been on safety. So we are challenged that I think we have as occupational hygienists or health and safety professionals is making sure that even though these health risks aren't presented, or the effects of those health risks aren't seen today, or right now, making sure that we still put the same amount of effort and passion into preventing illnesses caused by those exposures as we do from fall from heights. We just have to really bring up health to be at the same level as safety without diluting any of the great work we do in that safety space.

(R) It's getting workers to think longer than just the emergency of I've hurt my arm, I've cut myself, I can feel/see blood, whatever it may be. Kate, thanks for coming in, I appreciate you are a manager of two different roles and how time-challenged you are at the moment, so thank you so much for being able to come in.

(C) Oh, thanks very much for having me, it's been great.

(R) Look, there's some fantastic information and points there that I think any workplace, whether you are a small business, a large business, can learn about selecting some of those key controls. If you'd like to get in contact with Kate, you can contact her through our show email which is scienceofsafetyanz@mmm.com. You could also email that address if you've got any comments, questions, suggestions, or any other topics that you would love to hear from or any other guests you think would be great to have in the studio here to have a conversation with them. If you need any help with any of your respiratory protection or PPE requirements, you absolutely can get in contact with 3M through that same email address. If you've really enjoyed the show and you don't want to miss any other

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