

3M Transcript for the following interview: Ep 72: Bushfires & Respiratory Protection - Part 2

Mark Reggers (R) Terry Gorman (G)

Introduction: The 3M Science of Safety podcast is a free publication. The information presented in this podcast is general only, and you should always seek the advice of a licensed or certified professional in relation to your specific work or task.

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 science 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 equipment or maybe you are a bit of a safety nerd who finds this stuff really interesting, then this is a podcast for you.

(R) Today, I continue my conversation with Terry Gorman, talking about bushfires and respiratory protection. This is part two. Enjoy.

(R) We've spoken in previous podcasts, and I've alluded to it today already, but filtration is one aspect of selecting a respirator. What are the other things that I guess firefighters to general public should be thinking about when looking at the range of respirators, because there's a range of different types and half face and full face and disposable? What are a couple of key takeaways as far as that selection aspect should people be thinking about, more than just the filter?

(G) So, the filter's crucial. As we've discussed, it has to be right. Other things to consider are the fit. Again, a crucial element, and there's several million faces out there that you cannot guarantee mask X fits every face on the planet. So, there will have to be an individual approach, if you like, to determine face fit is adequate. The comfort of said mask is also important. It's one thing to get a mask and put it on, but if it hurts, if it's really uncomfortable, if it's nearly breaking your nose, whatever, that's not a good solution. You need to look at something else. There is enough variability out there, different models, different sizes, different designs if you like ...

(R) Materials.

(G) ... different types of materials, exactly, that you should be able to find something that does the job. I understand it's not a simple thing because the average person's not an expert on this process, but it is certainly true that there is a variability there that we should be able to find a product that will fit the individual.

(R) Some of these firefighters you've seen in the news earlier this year, where they may be doing 10, 11, 12-hour shifts, so physiological load would be a huge factor as well and having a disposable. That's going to move a lot more potentially because of the sweat. There's so many things here.

(G) It's not a simple issue, Mark. There's no silver bullet product. I wish there was. So, it's an individual approach or let's call it a category approach, depending on the task you're doing, depending on the type of exposures and the levels. All of these things have to go into the mix to try and find the best overall approach for your application.

(R) Full face to half face; what does that bring to the situation?

(G) A full-face mask will give you an increased level of protection, so we are able to get a better seal around the circle of the face, or the oval face shape that people have.

(R) So, up the forehead, down the side.

(G) Right down the side, under the chin; much easier to seal on, broadly speaking than over your nose, down the side of your nose and back around and under your chin that a half mask requires. So, full face gives you protection at a higher level in a respiratory sense. It's also giving you coverage of your face. That's protecting your eyes. That's protecting your skin, your forehead from the heat, from impacts, whatever rubbish is falling out of the trees, whatever issues there are. So, it's giving you a higher level of protection all round. The downside is of course; it's a bit heavier, it's covering more of your face and head and therefore will be a bit hotter to wear. So, it's again a case of balancing up what's required, what are you doing, is this worth the effort, is this worth the extra weight, the expense, the extra discomfort?

(R) We've spoken many times about the compatibility of PPE and eyewear and goggles and respirators always comes up, and I've seen many firefighters wearing the goggles and a half face mask. So, it comes to that individual, whether that preference for a goggle half face and can it fit depending on the person to going to a full face, which is going to be that all in protection as well.

(G) Yes. I have that problem. I wear glasses. I'm short-sighted and I can't see in the distance. If I put a full-face mask on, my normal glasses can't be on, and therefore, I'm at a great disadvantage. I can't see. So, there are ways around that. You can get specific frames that fit inside these full-face masks that you can get your prescription put into those frames and fit inside. So, you do have your spectacles inside the face mask, and you can see. Obviously though, that's not

something you can turn up in five minutes. It's something you need to get prepared beforehand with expense associated with that. You've got to have that done by an optometrist. All of these things, again, make it a bit more complicated and a bit more of an issue, but it can be done. Whether people go to that extent in the 99% of time when you don't need a respirator, spend all this money for the 1% when you do. What do people need and what will they be able to have ready when the time comes?

(R) As we've mentioned a couple of times, fit is incredibly important to get that overall protection, but what are some basic fitting tips for people that are maybe putting on disposable respirators or half-face masks or full-face masks that they should be aware of?

(G) Yeah, so things like, as we said, be cleanshaven. You will get degraded protection if you've got any significant facial hair that gets between the mask and your skin. So, large moustache with long strands running out the side, long hair that might get in the way of the mask, large sideburns; all those things can potentially be a problem. So, cleanshaven on those sealing surfaces is important. Looking at the fitting instructions; the Australian Standard requires every product to be supplied to the end user with fitting instructions. Look at them. Understand them and put the mask on as indicated. That will give you the best chance to get that part of the process right. Make sure you've got it on and adjusted appropriately as indicated in those instructions.

(R) A couple of things I've seen on social media where people have the mask unfortunately upside down. They put it on trying to get it on as quickly as they can. I've also seen where the straps will be crossed over rather than having one above the ear around the crown and one around the neck. I mean, fitting a respirator isn't hard, per se, but there's a couple of simple things that you need to get that protection being there. The other one I quite often see where people will just pinch

the nose bridge and it will create a V which just creates a big opening rather than trying to mould it to the nose. So, there's some simple things that I've seen. Anything else that people commonly don't get right with fitting respirators?

(G) I think it's a case of being prepared, Mark. So, don't wait until the day to start learning how to put on your respirator. Do that beforehand. Make sure you're familiar with the fitting process. Make sure you're comfortable that you've got it on, you can get it on without any great drama, and you understand what you need to do. Any problems that you might have, you can always chase up the manufacturer. They will always be able to give you a bit of extra information, more in terms of fitting instructions, posters perhaps, or more detailed instructions ...

(R) Videos.

(G) ... videos, etcetera to help you get the desired outcome.

(R) Is it also a requirement for people to be fit tested wearing masks for bushfire smoke protection?

(G) In a workplace, it is required. You need to provide people a safe workplace. Now, staring down a bushfire, it may not be considered a safe workplace in that context. But it would be a responsibility of the overarching organisation that supplying any PPE, you need to supply a product that you can fit to the individual, whether it's a pair of boots, obviously it's got to fit. Whether it's a pair of spectacles, they need to fit. A respirator must fit, and a fit test is a way to prove that respirator model X does fit my face and model Y might fit your face, etcetera.

(R) We've done episodes before on respiratory fit testing about the ... as we've alluded today, there's millions of millions of different people with face shapes and sizes and people with broken noses and scars and it's not a this mask fits

everybody the same, so that fit testing really is a key step when it can be done. If it is an emergency situation, and that's not practical, how can people check if a mask is getting a seal in a more non-scientific way?

(G) The down and dirty on-the-spot approach is to use a seal check. So, you can put the mask on and again, most user instructions include this as part of the process. They'll get you to put the mask on in a certain way and then the last step will be to do a fit check, which means you can cover the exhalation valve or cover the inhalation through the filters and by either sucking in or gently blowing out, you can get a feel for how well that mask is fitting on your face this time, today. Whether you feel the air jetting up the side of your nose, indicating it's not sealing over your nose, or you feel a leak out under your chin when you blow out; those are showing you you've got a gross leak there and you need to readjust, refit, try again with another user check. Those give you ... if you feel like you've got a fit, it gives you a broad, rough and ready guide that yes, you've got it on appropriately today.

(R) And if you're with other people, you certainly can be looking at other people's fit and if you're seeing something obvious that isn't creating a seal, please talk to other people and let them know, especially when we look at the emergency situations we have seen in Australia. Look out for each other, so if you do see someone that maybe has their mask upside down or with the straps crossed over, you're doing them a disservice by not saying something to them. So, it is really critical to look at other people around you in case there is something that does stand out.

(G) Yeah, for sure, and for those people who are involved ongoing, let's say the volunteers, they need to be again looking at this sort of issue in the quiet times. Let's call it hopefully in the months ahead, wintertime, when it's nice and wet and raining and they're not out on the fire lines. That's when they should be making sure they've got the mask they need, and they know which mask fits their face as

opposed to their partner's face. It may be the same mask. It may be a different mask. It depends on what's working for that individual. That's the time to find the mask that fits and then practise using it. When the time comes to use it in anger, you've got the right mask. You know it fits, and then you can use it appropriately with confidence.

(R) Thinking about the general public, you're seeing different cities. We're in Sydney and during those high fire times there's a lot of smoke coming across different populations. People wear surgical masks that aren't sealing around the side of the wearer's face. What level of protection could that be providing?

(G) Virtually zero. It will stop sticks and bricks, but they're not designed with a face seal. If you look at them, they're just literally, as you say, a square pulled over your face. It does not seal on the face. It's not designed to do so. It's a surgical mask. What it's designed to do is to stop the surgeon spitting on the patient, if you like, or contaminating the field that they're working in. In terms of protection, let's call it in the civilian sense, out on the streets, it will do something if the wearer is coughing and spluttering and potentially spraying, if you like, their liquid contents around.

(R) Spittles?

(G) Yes. That mask will capture that in a gross sense. It will capture that spray and keep it from getting out, let's say, into the broad open breathing air where other people could breathe it in and if it's infectious, potentially you've got an exposure. So, from that point of view, it does have some application, but in terms of protecting the wearer, it will not stop those PM2.5s, those very small particles. They will mostly go around the sides and the exposure will still be there. The air will take the easy course around the edge of the mask and down your throat, not force itself through that filter. Let's call it very little protection in a respiratory sense.

(R) Something I know I was getting asked quite a bit over the start of this year, is about the use of industrial adult respirators being worn by children. Should children be given respirators?

(G) This is a very difficult problem. We can clearly see that children need protection from contaminated breathing air, like anybody else does. The problem is all respirators, the current crop let's call it, are designed for use in workplaces by adults. In our society, we don't have children working in workplaces and needing protection from contaminants in those areas. So, they're not designed for children. There are difficulties in even defining the edges, right. A 16-year-old may well have an adult sized head and potentially could wear an adult sized mask. But smaller children will not have that size. They will have trouble getting a face seal with a mask that's too big for them. They may even have trouble breathing through that mask if they do get it on because the masks are designed for adult lungs with adult capability, not with the capability of an eight-year-old or a ten-year-old's lungs, which may struggle with the breathing resistance that those products can have. Some will be not so bad. Some may be quite significant and cause a breathing restriction problem for the child. So, it's a very tricky thing to find a mask that is going to work with a child. In those terms, physiologically, in terms of fit, in terms of the child leaving the mask on; at some point, a young child is just going to rip the mask off at every possibility because it's too hot, too uncomfortable, it makes it too hard to breathe. Whatever the reason, the child will not be able to keep it on with mental discipline. They'll just take it off. So, there's all of those issues creating a big gap that is not dealt with by the Australian Standard, which is occupational. Government has not dealt with in terms of being clear on what they may require. Manufacturers have not made masks for children because there is no standard for that. So, I absolutely agree this is a hole in the whole process where we cannot cover children effectively in a broad sense, right now when air quality is at those hazardous levels.

(R) So, you need to look at some of those other controls we mentioned about the hierarchy of control, trying to keep them indoors if we don't have to take them outside. We take them to a shopping centre or a cinema to really control their exposure not by using PPE or respirators, but through other methods there. And there could be a suffocation hazard, choking hazard as well when we start talking about the straps and other things that children are likely to put in their mouths. I've got a one year old and there's not much that gets in his hands that don't end up in his mouth after a very short period of time.

(G) Exactly. There's a whole range of issues there. It's a complicated issue. I think we, globally even, not even nationally but globally, I think there needs to be attention paid to let's say civilian protection where we have to look at the possibilities for children, the possibilities for those who can't wear masks, who have some compromised breathing issue. All of these things need to be taken into account and some appropriate approach made that gives people options in those terms of where there are those exposures. But you're right; absolutely do the things that you can do to reduce exposures that are not mask-related, that clearly can help reduce any exposure.

(R) So, once the bushfires have gone through an area, and houses are burnt, a lot of people returning back to properties and areas, and there's going to be a range of respiratory hazards there, what broad advice would you be recommending for people coming back into that situation, because there's going to a whole rebuilding effort, let alone the people coming back to their own properties to see what survived?

(G) Yes, absolutely. The obvious things are there's going to be a lot of particulate. Again, stirring up the ashes if you like, there's going to be particulate released in terms of the clean-up or just fossicking through the remains or whatever. So,

you're back to a particle exposure and back to thinking about whether masks should be worn. Your concern also might be asbestos. There could well be asbestos sheeting, asbestos products on some of the properties that have been burnt down. Again, you can disturb that and get some level exposures to asbestos.

(R) I know looking at fire damage, what would've been classed as non-friable would be classed as friable after going through a fire situation, so there's such a high potential for disturbance if you aren't aware that it may be there.

(G) Absolutely, and it's hard to know. It's going to be case by case. Again, there's going to be places with no asbestos in it, because they're relatively modern let's say. But I can imagine sheds, old sheds and old buildings out in the country, in the rural properties that may well have a lot of asbestos type sheeting and those things. So, clearly, something to consider, but again, that mask approach is going to be well for asbestos as well and give you a level of protection there that may be appropriate. If it's going to be significant, you may well be then at the point of calling in the experts, the asbestos removal companies who can do the job professionally, again, with the higher-level protection, higher level controls that will allow that to be done.

(R) You're certainly not going to be back into these areas until you've been given the okay by the authorities. You're not going to be charging in there before you're given the approval, because there's so much here. You're talking about burnt LPG bottles. For those going back into the area, you just really need to be careful and do the right things, because there's so many things there, potentially.

(G) Yeah, exactly, so again, listen to the experts. Listen to the local council. Listen to the fire guys. Listen to all the people involved in those areas. They will have information they can give you and make sure you make sure you know what you're getting into and stop and think and ask if you're not sure,

(R) We've definitely a wide area around bushfire smoke and for general public, and for bushfire fighters. What advice, summing up everything we've spoken about, would you want to leave to our listeners today?

(G) I think this is going to be an ongoing issue. I think with the climate change issue, the fact that we are going to get these fires next summer and the summer after that, and the summer after that, hopefully nothing like we've had this summer. But we don't know. We will eventually get to the point where we've got a little bit of time to stop and take breath in this season. We get to the wintertime; that's when we need to start thinking about what about the next summer? What equipment do I need? What gear, what products? What am I worried about? What protection levels? That applies to let's say even the people in the exposed side, just the general public. It certainly applies to the volunteers, the people who are going to the fire front. Can they find the right gear that's going to help them next time, so that they can protect themselves and their buddies when they're out there next summer.

(R) For those that want to do a bit more reading, as you say, as it dies down, hopefully heading into the winter months, where can people go to find a bit more information about bushfire, emergency preparedness and respirators in general?

(G) I think there's plenty of government websites. The federal government has got information. The state government, the fire authorities have got information on their websites. The New South Wales volunteer bushfire brigade have got their information. Those have all got good basic information and if you're looking for more information about specific products or options for products for certain applications, go to the manufacturers and suppliers who can give you that sort of detail.

(R) Well, thank you so much for coming in again, Terry. There is quite a bit here in what we've seen in Australia, so hopefully this information will help heading into the next fire season, and for those that are doing that preparing, as you say, when it dies down a little. But thank you once again, Terry.

(G) Thank you, Mark.

(R) Well, thanks for listening, everyone. You can get into contact with the show by sending an email to scienceofsafetyanz@mmm.com if you have any questions, topic suggestions or you'd like some assistance in your workplace around selecting the right respirators or PPE, or if you're needing selection help around respirators for bushfire protection, 3M are certainly here to help. You can also visit our website 3m.com.au/sospodcasts for further resources on bushfire and respiratory protection that we've spoken about today. Be sure to subscribe, rate, review and share through Apple Podcasts, Spotify, Google Podcasts or wherever you get this podcast from. And as Shane Parry said, "Replace the need to be proven right with the need to achieve the best outcome." Thanks for listening and have a safe day.