

## **3M Transcript for the following interview: Ep 79 Surgical Masks V Respirators**

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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 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, we're talking all about surgical masks and respirators with Terry Gorman. Welcome back, Terry.

(G) Thank you, Mark.

(R) For those that haven't listened to any previous episodes we have done together, can you please introduce yourself, who are you and where are you from?

(G) I'm an occupational hygienist working for 3M Australia, have been doing that for 20 years. Before that I was a consulting hygienist with the government.

(R) So, today we're talking about surgical masks and it's something that does come quite often because you will see in many parts of the world, and I know here in Australia, you'll see people walking down the street with surgical masks being worn

as respirators. So, I really wanted to try and tease out the difference between the two of them and where one may be suitable and where may not be suitable. So, what is the difference between a surgical mask and a respirator?

(G) So, a respirator is designed to protect the wearer from an airborne contaminant that is present in the breathing air.

(R) Dust, gas vapours, whatever it may be.

(G) Whatever it may be, absolutely, and there's obviously different levels at which you can do that, different types of equipment all with their own features and benefits. But it's trying to protect the wearer, who's often a worker, from these exposures. A surgical mask is a product used mostly in the healthcare world to protect the wearer from gross splashes that might happen from a patient, whether it be blood, whether it be bodily fluids.

(R) A cough or a splutter or vomit.

(G) Yeah, exactly. So, it's there to provide a barrier, if you like, from those. It's not protecting them in terms of a respirator approach.

(R) Is it also protecting the patient from the wearer of the surgical mask, so them exhaling and coughing and putting things back out from an infection point of view?

(G) It protects them again at a gross level from those let's say excess releases. So, we've all made a small spit or whatever when we're talking sometimes. That thing falling into a surgical field or an operating area can be significantly hazardous for the patient. So again, the surgical mask is supposed to capture the worst of that.

(R) So, we've spoken many times before together on this podcast and many of our listeners would be familiar with Australian Standards 1715 in the respirator world of things. Is there an Australian Standard or equivalent information about surgical masks?

(G) There is. It's 4381 which is the Surgical Mask Standard.

(R) So, we've got different types of respirators and levels of respirators. Is there different levels of surgical masks that are used in healthcare settings and other environments?

(G) Yes, there is. They've got three different levels. These are rated differently according to their - essentially according to their filtration performance, their breathing resistance and their fluid resistance. Type one is for general use, let's say, in the wards. They're normal, let's call it, applications.

(R) But not of high risk or expected risks of body fluid or blood or splatter, not to get too visual side of things. There's no type of environments which is a realistic work environment for a healthcare setting.

(G) Yes, that's about right. Level two is for places like the emergency department where there's an increased chance of those fluids being encountered by the wearers. They need some protection and they can wear them when they're treating the patients in those more, let's say, uncontrolled environments.

(R) And then level three? What's level three?

(G) Level three is in the operating theatre or similar, where you are right into the patient and again, those potential exposures could be very dangerous for the patient. You need the higher level of protection for the patient. You need the higher level of protection for the operating staff who could be sprayed again with various fluids, depending what's going on.

(R) Is there different filtration levels between these different types of surgical masks, a bit like a P1 to P2 to P3? How does that vary in the surgical mask side of things?

(G) There is a filtration test, bacterial filtration efficiency test, BFE for short. It's an imitation test, if you like. It's not really bacteria, but they use a substitute. This requires the product to have a performance and there are two levels of

performance in the test. Level one is required to pass the first level. Level two and three are required to pass the second level of filtration efficiency.

(R) Do surgical masks have to be approved by other bodies, being the healthcare setting, versus ... I know respirators, you can have it approved by Australian Standard testing methodology and then it's good to put out in the world in most circumstances?

(G) The TGA is the relevant body in Australia, so equipment that's used in operating theatres and specific clinical applications have to be approved by the TGA.

(R) And who are the TGA? What does that stand for?

(G) Therapeutic Goods Administration. For general use, used away from operating theatres, in general areas like the wards, the TGA does not require these products to be licensed or checked by them.

(R) So, in the healthcare setting, when may or where would a rated respirator be required, and not a surgical mask that we've been talking about, be used in a healthcare setting?

(G) So, there's a range of potential exposures in healthcare and again, there's always exceptions. So, this is by no means a complete list, but there's a number of common areas. One is product cleaning, so endoscopes, various instruments and products that are cleaned by healthcare staff. They use chemicals. Glutaraldehyde is a common one that they dunk those bits of gear in and get them cleaned, ready to be reused. So, we need to wear an appropriate filtered gas cartridge to enable that protection for those workers. There's other laboratories where formaldehyde's in use; pathology labs or mortuaries or places they are dealing with human tissue and storage thereof. So, again, formaldehyde exposure is potential in those areas. In the emergency department, they will occasionally get people come in who have been exposed to some sort of poison or some sort of chemical and the patient is exuding or releasing vapours and gases and the healthcare staff clearly need to be

protected from that. Organophosphate poisoning is a classic. The person who has consumed that product, normally in a suicide type scenario, the result is an exudation of fluids and gases and vapours being released from the patient. The healthcare staff dealing with these patients can be exposed to these gases and vapours and can make them quite ill. So, there can be a need for protection for those let's say initial response people who are dealing with a patient just come in the door with one of these types of exposures.

(R) For infectious diseases associated with small aerosols, like bacteria and viruses, would a surgical mask or a respirator be more suitable, E.g. Ebola or influenza A in those types of environments?

(G) Well, there's not one answer to that. Everything has got its own answer. So, the healthcare experts or let's say the infectious disease experts look at these types of diseases and put in controls appropriate to those. So, for something that's benign, there might not be needed anything more than a surgical mask. In other words, no respiratory protection; just a physical barrier type scenario. For things that are a bit more infectious like influenza or TB, they may require the staff to wear a P2 respirator or an N95 that it's commonly called in the healthcare field, to protect the workers while they're dealing with infectious patients. If you go up the scale to things like Ebola, they'll be looking at more extensive coverage of the whole body; suits, gloves, etcetera as well as respirators, including PAPRs. It all depends on the let's say the interaction scenarios. It also depends on what equipment is available. So, it's a case of the appropriate response according to the guidance given in those circumstances. In other words, listen to the experts and do what they tell you to do for those different exposures.

(R) Can you get products that are both rated as a surgical mask, so with that fluid resistance, and also Australian Standards rated respirator? We can tick two boxes that can be used in both situations if and where required.

(G) Yes, you can. There certainly is plenty of rated respirators that are fluid resistance, do have the appropriate performance in that regard. Where you will have a slight difference, is they will not necessarily meet some of the other breathing resistance requirements for example that the surgical mask standard has in place. That's because the respirators are actually doing filtering and there is an associated resistance to breathing with that. Surgical masks are not filtering. They are basically stopping the big stuff, as we said. The air is flowing around the outside where there is no seal and that's why they're not a respirator. So, you can certainly get that fluid resistance performance and that blocking performance from a properly rated respirator that can be used in a surgical mask type application.

(R) We've spoken previously about when workers or wearers should change their respiratory filters. What's the go in a healthcare setting? We start talking maybe that something is a surgical mask but is also a rated respirator. Are there any rules of thumb or guidelines on how often these should be getting changed?

(G) The infection control people are the experts in that area again. They will be telling the staff that if they're dealing with a patient in scenario A, they may not need to put a mask on. Scenario B, they may need to put a mask on, that they can use several times during the day. Or scenario C, they may have a mask they can only use once. They use it, they treat the patient, then they throw it out and they will put on a new mask for the next patient or the next visit to the original patient. So, again, it's a case of the appropriate response according to the circumstances. Follow protocol, follow the rules, as they say.

(R) I assume it would be similar if a mask is damaged or a surgical mask is damaged. That would be another indicator or time to not use that mask and replace if that's the case as well.

(G) I think any PPE or any piece of equipment that doesn't look like it's supposed to look, something's amiss, something's broken, something's missing, certainly you

would not use it. You would put it aside, find one that was in good condition and use that.

(R) With respirators, and we've spoken many times, and many in the industrial space are very familiar with the requirement to be clean shaven, fit tested. Is that the same requirement for surgical masks and respirators being used in the healthcare setting and environment?

(G) I think broadly that requirement applies to any worker under the current laws and systems and the Australian Standards certainly says that. The healthcare system is a bit outside the normal industrial world in terms of it's got its own special rules and application of rules. But broadly speaking, the same performance is required. In other words, a face fit is a face fit whether you're a healthcare worker or a guy working on an industrial production line. So, to get the performance from the mask, if you need that respiratory protection, you need that fit test performance to be acceptable as well.

(R) That seal is so important. It doesn't matter how good a filter is. If there's exposure happening because it's getting into the breathing zone, bypassing the mask, we want to make sure that is being addressed as well. So, I've commonly seen many people in Australia and probably more common in many of the Asian countries where people will be wearing surgical masks walking down the street. What kind of level of protection would that be actually providing them? I know a lot of them are wearing it for air pollution, but what is it actually doing for them?

(G) I don't believe it's doing a whole lot, is the short answer. There is certainly a place for it, and I won't say it's doing absolutely nothing. Certainly, if you're in a crowded train or bus or whatever, wearing that mask will protect the others in the bus because if you're coughing and spluttering, the mask will capture the, let's say, the releases and prevent it getting out into the general breathing areas for the rest of the bus or the train. So, it is considerate in that sense, that you are protecting the rest of the world from what you may be having. In terms of protecting yourself,

these masks are not doing a great deal of filtering of anything. The gas and vapours will be following the air around the side of the mask and going straight in and out of your lungs. They may capture some of the big dusty particles. They may reduce your exposure to the particulates a little bit. But again, it'd be fairly low in terms of protection level and not broadly going to protect you from the pollution that can be evident in some of the cities we've all seen.

(R) We've touched on a couple of key areas regarding surgical masks and their differences between respirators, but what would be some key takeaway points you'd want to leave with our listeners today?

(G) It all comes down to specifics, Mark. So, people must use the right gear for their application. Get the information you need from your managers, from your health and safety people, from your infection control people, whoever is the appropriate one in your world. Make sure that you understand what's required for the task or tasks that you are involved with. Make sure you've got the right gear. Make sure you understand how it works and that you can assess that it is working appropriately. Make sure you can do the maintenance and care on that product, if needed and make sure you are fully conversant with all of the parts and performance issues, so that you will be getting the protection you need in your workspace.

(R) And for those that are interested to find out a bit more, where's a couple of places they could head online to do a bit of research?

(G) There's lots of information about infectious diseases from NIOSH and the Americans, the Centre for Disease Control. Those places have a lot of information out there about the appropriate levels of protection. The Standards still apply, 4381 gives guidance. The respirator standards of course give guidance, 1715 and 1716 and no doubt, there's a whole lot of other information online from all the relevant areas of healthcare that would give some guidance.

(R) Well, thank you for your time, Terry. Much appreciated once again.

(G) Thanks, Mark.

(R) 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 if you would like some assistance around the appropriate selection, use and maintenance of PPE, respirators, surgical masks in your workplace, 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 surgical masks that we've just spoken about, as well as the transcript for this episode and all the other previous episodes we've done so far. Be sure to subscribe and share through Apple Podcasts, Spotify, Google Podcasts or wherever you get this podcast from. And as Julie Garland said, "Be a first-rate version of yourself, not a second-rate version of someone else." Thanks for listening and have a safe day.