

Welcome to COVID-19: Preparing Yourself and Your Family. This module is meant to educate the public on what many call the hierarchy of controls – a tool used to help determine what the best preventative measures are for risk. My name is Sam Lushtak, owner of Absolute EHS.

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All safety professionals rely on this hierarchy of control diagram when working through risks. Many other professionals fit into this hierarchy as well. I will primarily discuss medical professionals and public health officials throughout this presentation. Please see the companion module on my website which discusses what professionals do with more detail.

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At the top, we have our first choice when faced with a risk. Elimination. This means that we have a risk or potential hazard and we can actually make it disappear. For example, if you had an extension cord that was going across a room – you might look at it and say that it could cause an electrical fire or cause someone to trip. If you had a professional electrician come and install a wall outlet in an appropriate location, you would not need the extension cord anymore. You eliminated the risk for an electrical fire or a tripping hazard by taking this action.

If we are unable to eliminate the hazard, perhaps due to time or money, we move down to the next level.

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Substitution would be taking the risk and replacing it with something less risky. A good example here would be using a battery pack instead of the extension cord for the item that needs power. By using batteries, we still have a potential fire risk but it is less likely as there is less to catch on fire. Before, the outlet or the extension cord could have been faulty and started a fire, now only the battery pack could potentially catch fire. We also no longer have a tripping hazard.

If a substitution won't work, we move down to engineering controls.

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Engineering controls are next. This would be a concrete way to isolate people from a hazard – in this case, there is rubber insulation around each individual wire inside the cord – to prevent electrical fire and then an additional insulating sleeve around the entire cable to prevent shock to people using the cord. These controls would need to be deliberately altered to be rendered ineffective – you cannot forget to insulate your cable – it is part of how they are made.

If engineering controls won't work, usually because of cost, we need to rely on administrative controls.

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Administrative controls are akin to laws and policies. In the case of our electrical problem, administrative controls would be NFPA 70E – also known as electrical code. Electrical installations need to be inspected and signed off on and they need to adhere to published codes. One problem with administrative controls is that they are highly subject to human error or lack of knowledge. Did you

know that your circuit breakers at home need to have a 36" clearance all around them? Most people don't. This is one of many shortfalls with an administrative control.

If administrative controls aren't effective, we rely on PPE. Administrative controls usually require the use of PPE – these two levels are commonly interrelated.

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Our bottom level, which is the least effective level, is personal protective equipment, or PPE. PPE use is a last resort. In the case of our electrical problem, we hired an electrician to complete the elimination control and install an electrical outlet. While the electrician is working, he or she needs to wear special clothing, boots, eye protection, and gloves as they are putting themselves in a very dangerous position by "confronting" the hazard. Now, in reality the electrician would also be able to cut the power to the outlet but they still need the appropriate PPE in order to protect from shock or accidental electrical discharge if they did not prepare for their project correctly – another potential form of human error.

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In terms of COVID-19, for elimination we eliminated the needs for the extension cord. For a pandemic, the only way to eliminate the virus is if we all die. This is not a viable solution so we need to move on to the substitution level.

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For substitution for our electrical problem, we used a battery pack instead of an extension cord and wall socket. In terms of COVID-19, a vaccine will act as a substitute to our bodies and approximate the virus so that we can create antibodies. The creation and distribution of a vaccine to a majority of our population will be our best bet as a human race in defeating this pandemic. This is what medical professionals are working on right now. It will be the most effective solution but it will also take the longest amount of time to develop.

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Our engineering controls for electrical wires are plastic sleeves around each individual wire and around the entire cord. Unless consciously and deliberately tampered with, or grossly neglected, this control is unlikely to fail. There is no engineering control for the community with respect to COVID-19.

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Our administrative controls for the electrical cord fell largely onto published, legal, electrical codes. For the spread of a pandemic, administrative controls are mandates to stay home, banning air travel, or the direction to maintain social distancing at a minimum of 6 feet. These regulations are harder to enforce and easy to forget. The key to making administrative controls stick is to make the consequence outweigh the violation. Some countries are giving out very hefty fines for violating quarantine, others have societies that will socially shame people into following rules. The drives to follow administrative controls can vary but they are still prone to human error which is why administrative controls commonly come with PPE suggestions as well. Public health officials are working tirelessly with politicians to push administrative controls through. These things take time though and are coming out in a somewhat piecemeal fashion at the moment.

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PPE for our electrician has similar shortcomings to PPE for our doctors. These items are specific to a task – an N95 is going to have different specifications than a surgical mask which will have different specifications than a homemade mask. For more information on that, please see my module on masks. In a nutshell though, an N95 will do more good for someone likely to be exposed to COVID-19, like a doctor, a surgical mask is better for someone who is actually sick or coughing as it will contain sputum, and a homemade mask will be more useful to someone asymptomatic as a deterrent to touching their own face – a bandana will likely be safer for this person as there are fewer other risk factors. The person wearing PPE still has to remember to wear it, remember to inspect it, dispose of it after use, maintain it, make sure it fits correctly, has the appropriate specifications, and is affordable and available. PPE is the last line of defense against this pandemic. Safety professionals have been helping disperse and fit test people since late December, when COVID-19 was first identified. Our assistance and use is evolving as time goes on but the hands-on aspect of work started a few months ago for many of us.

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So what can you do? We are at the lowest two levels of the hierarchy of controls. Essential employees, those associated with food and medicine, specifically need to be out in the danger zone – or hot zone. They can only rely on PPE and we need to hope they have the correct supplies and know how to use it. As a non-essential person, everything in our power needs to be done to abide by the current administrative controls. For some, this means quarantining yourself at home. For others, the administrative control is social distancing of at least 6 feet but, given that you are watching this video, you KNOW that this is playing with fire. Stay home. If your family needs groceries, try your best to leave the kids at home and have only one person from the household go shopping. This person needs PPE and they need to understand how to properly use it. Better yet – have one person do the shopping for multiple households and do a contactless drop-off to the neighbors or other family member. It is human nature to forget the rules sometimes so know that this one person is a potential point of failure for the whole household. For this reason, we need to limit these trips as much as possible. I'd refer you to the module on social distancing if you would like more information on this topic.

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As soon as it becomes available, we need to figure out how to prime our bodies to make antibodies. Vaccines or blood treatments may end up being the answer to this but it is too soon to tell. If we take this seriously now and rely heavily on Administrative controls, courtesy of public health professionals and PPE, from safety professionals, we can buy more time for development of a more permanent solution.

I would also mention that the less harm we befall on ourselves by driving and getting into a potential car crash and climbing trees, the more focused medical professionals can be on the pandemic patients and the more easily we can avoid going to a hospital and breaking social isolation rules.

By combining the efforts of Safety Professionals, Public Health Officials, and Medical Professionals, we can get through this together but we need to know who has what expertise and understand each other's backgrounds and focuses.

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Thank you so much for listening to this module on the hierarchy of control. Feel free to email me if you have any questions, personal or about this presentation, at Samantha.lushtak@absoluteehs.com. Feel free to also check out my website for a webinar recording and a variety of shorter modules, support documents, and things to do.

Finally, please consider supporting my small business at this time, particularly if you found this information or the worksheets and documents on the website helpful. Donations can be made via PayPal or through Venmo to Samantha-Lushtak.

Stay safe and stay home!