



Announcer:

It's time for the *IHSA Safety Podcast*.

Ken Rayner:

Welcome to the *IHSA Safety Podcast*. I'm your host, Ken Rayner. On today's episode, we're going to discuss working outside in the Canadian winter with IHSA's Occupational Hygienist, Jasmine Kalsi, who is a regular guest on the *IHSA Safety Podcast*.

Welcome back, Jasmine.

Jasmine Kalsi:

Yeah, thanks for having me.

Ken Rayner:

So Jasmine, I've experienced 50 winters in Canada, and I can say without question that the winter months and sometimes parts of the spring and fall can bring temperatures cold enough that the temperature is a hazard itself.

And on episode 60 of the IHSA podcast, you joined us to discuss heat stress and understanding the risks, symptoms, and controls. So today we're going to go to the other end of the temperature spectrum.

So let's start with what is cold stress, Jasmine?

Jasmine Kalsi:

Yeah, for sure. So cold temperatures actually are often a part of Canadian winters, and this is something that we typically see and it applies to us on the East Coast. So we can see temperatures dip below zero degrees Celsius and typically reach into the negatives, negative tens, twenties, and even thirties.

So, for those who are working outdoors, especially carrying work out in the cold and wet as well as windy conditions, this is where you can see workers potentially face cold-related illnesses. So in a nutshell, cold stress is a response of the human body where you would typically see your body's core temperature dip below 37° C. This is what our baseline core temperature should be. So this is the opposite of what you would typically see, for example, with heat stress.

So, cold stress can occur when the body is unable to warm itself to maintain this core temperature of 37 degrees. And this can result in cold-related illnesses. You can even get tissue damage and to an extent, in extreme cases, even death.

Ken Rayner:

Okay. So, something we absolutely have to pay attention to. And Jasmine, are there different types of cold related illnesses like we talked about with heat stress? And if so, what do those symptoms look like?

Jasmine Kalsi:

Yeah, so for cold stress, and these are fairly common ones you would probably hear about, there are two major cold-related illnesses which can occur, and this would be hypothermia as well as frostbite.

So, I'll first go over hypothermia. So, hypothermia occurs when the body can no longer maintain its core body temperature by constricting its blood vessels. Symptoms of hypothermia include persistent shivering, and you would get the severe type of shivering occurring when the core body temperature hits around 35 degrees Celsius. Other symptoms involved are blue lips, you get the blue fingers, confused behavior is usually involved, poor co-ordination, and unfortunately even reduced mental alertness.

The other commonly known effect of cold stress is frostbite. Frostbite is caused by exposure to severe cold or even contact with extremely cold surfaces. So think metal objects. So, when you think of frostbite, think of parts of the body which can contact cold surfaces. The first ones that would come to mind would be the extremities, right? So, this would be our fingers, our toes, our face, even our ears. Signs and symptoms of frostbite, they include a sharp prickling sensation. Usually, the first indication of frost bite is when the area becomes numb and you start getting... It feels, like, waxy.

So, if you leave it unattended, it can potentially do permanent tissue damage as well.

Ken Rayner:

Wow. Okay. So the industries that we support, Jasmine, as our listeners know, we've talked about this a lot of times, construction, transportation, and the electrical utilities. Are there any at-risk tasks in those industries that we support where workers could experience cold stress?

Jasmine Kalsi:

Yeah. So, pretty much anywhere where work is being done in cold temperatures, this is where you get the at-risk for exposure. So, exposures can occur when workers are working on, for example, rooftops or in unheated cabs during cold temperatures. Any work that's being done on bridges or where projects are near large bodies of water, there is that risk factor of being exposed to cold.

Other areas where exposures can occur include any tasks that are being done in high buildings which are open to the wind, working in even refrigerated rooms, any vessels and containers, as well as working on utility poles when, again, the temperatures are far into the negatives.

Ken Rayner:

So, we've definitely determined that working outside in the cold temperatures can be a hazard for employers in Canada, in Ontario. So, what are some of the tools for those employers for them to assess cold stress in terms of understanding what are the risks?

Jasmine Kalsi:

Yeah, so I first want to note that Ontario does not have legislated exposure limits for working in cold environments. However, under the *Occupational Health and Safety Act*, employers must take every precaution reasonable in the circumstances to protect workers. This includes protecting workers from working from outdoor hazards. So, protecting workers from cold stress would fall under this description as well.

In terms of tools itself, there are a few tools that are available to the employers which can be used to determine the risk of cold stress in the workplace. One of them is by WorkSafe Saskatchewan. WorkSafe Saskatchewan developed a table outlining a work warm-up schedule. So, this table pretty much outlines the number of breaks which are recommended, factoring in air temperature as well as wind speed. The table also highlights when non-emergency work should be stopped. Again, this is all dependent on what the wind speed is as well as air temperature.

Another tool, which may be of interest to our listeners is a calculator by the Occupational Health Clinics for Ontario Workers, and they're known in short as OHCOW. So, this is a cold stress calculator, and it's a simple means of determining what precautions should be taken to protect workers. So, you pretty much... It's an Excel sheet, you input the temperature as well as the wind speed, and it calculates the wind chill.

The convenient thing about this tool is that whatever the result is, depending on whatever you input in, it lists the corresponding health concerns as well as recommendations on what precautions can be taken in that scenario.

Ken Rayner:

Fantastic. So, another great tool from our sister association, OHCOW, and no big surprise, Jasmine, that WorkSafe Saskatchewan has come up with a tool to be able to assess that. I mean, knowing that when we sometimes see the temperatures across Canada in the winter time, Saskatchewan sometimes has the coldest. So, appreciate that it's an even sometimes-bigger hazard in Saskatchewan than it is for us in Ontario.

And you mentioned wind chill. How does wind chill play a role in assessing how cold it really is, Jasmine?

Jasmine Kalsi:

Yeah, so let's first define what wind chill is. So, it's pretty much the combined effect of air temperature as well as air movement. So, in other words, what is wind speed? So there is a calculation, I will not explain it now, but you can see the calculation in one of our resources online as well as if you even search it up.

But wind chill describes the effect of air temperature and wind speed on human skin, on exposed skin. So, for example, if the temperature is minus 12 degrees Celsius, and the wind speed is 48 kilometers per hour, this is the equivalent of facing minus 45 degrees Celsius with no wind.

So, the American Conference of Governmental Industrial Hygienists, which is also in short known as ACGIH, they had developed a wind chill temperature index, which indicates the risk of frostbite for exposed facial skin. Again, accounting for wind speed as well as air temperature.

Ken Rayner:

Jasmine, now we've talked about assessing, what about some of the controls that employers can put into place to protect their workers from experiencing cold stress?

Jasmine Kalsi:

Yeah, so there are a few controls workplaces can consider implementing to protect workers from a cold stress event. And I'll go over some examples. So, one of them can be, again, educating workers of the signs and symptoms of the types of cold stress-related illnesses. So, in the end, workers should be trained on what to do if they're experiencing or even realize if their co-worker is experiencing, a cold stress event.

It's a good idea to ensure workers are medically fit to work in excessive cold, especially those that are subject to risk factors. So, this includes anybody with heart disease, asthma, diabetes, and even white finger disease, it's important to get those checks in before working in extreme cold temperatures.

Another control, and we see this with heat stress as well, would be introducing work-rest schedules, providing hot drinks, and as well as regular breaks. Wherever these breaks are taken, making sure these shelters, these trailers, whatever they may be, are heated. These break rooms also are heated. Clothing also is another type of control, and this falls under the PPE aspect. Things to keep in mind are to ensure that you're dressing in layers, you're wearing synthetic fabrics, wearing waterproof clothing and wind resistant clothing can also aid in preventing a cold stress event as well as considering even wearing gloves or insulating gloves, especially when you don't need fine manual dexterity, it's not really a big requirement, then you can get away with wearing gloves as well.

One of the other aspects for employers is to create a cold stress prevention program. So, this is pretty much a formal program which outlines pretty much all the steps the employer should be taking to address a cold stress event. So, what type of training is provided to workers? How cold stress will be monitored. What are the preventative measures, first aid, and what does incident investigation look like? Again, everything around cold stress, this is what this program would outline.

Ken Rayner:

Terrific. And what about the additional resources, Jasmine, that employers and workers can look for on IHSA's website on cold stress?

Jasmine Kalsi:

Yeah. So, we do have some resources on cold stress. They are highlighted under the Winter Hazards topic page on ihsa.ca. Some examples of our resources include a safety talk on cold stress. We also do have a comprehensive standalone chapter in the *Construction Health and Safety Manual* (M029) that is free to download on our website. That's on cold stress as well.

However, if there are any specific questions to cold stress, you're always more than welcome to reach out to me directly at [jkalsi@ihsa\[dot\]ca](mailto:jkalsi@ihsa.ca).

Ken Rayner:

Perfect. And that email address again, [jkalsi@IHSA\[dot\]ca](mailto:jkalsi@IHSA[dot]ca). That's fantastic, and I highly encourage our listeners to reach out to Jasmine. She's an amazing resource. So, Jasmine, thanks again for sharing such important information with our listeners and our membership. This is terrific. And thank you to the listeners for listening to the *IHSA Safety Podcast* and our episode on working outside in the Canadian winter.

Be sure to subscribe and "like" us on your podcast channel and visit us at IHSA.ca for a wealth of health and safety resources and information.

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