

Your Body's Response to Snow Shoveling & Tips to Stay Safe

By ACSH Staff — January 27, 2016



[1] Snow Shoveling via Shutterstock

Winter storm Jonas swept through the East Coast and Mid-Atlantic regions affecting an estimated 85 million people over a 1,000-mile span, dumping more than three feet of snow in some places [the hardest hit being Glengary, WV, with a mammoth pounding of 42 inches](#) [2]. Considered one of the deadliest storms of the century second only to 2006 winter storm Maximus the blizzard is said to be responsible for at least [48 deaths](#) [3].

Hypothermia, car crashes, roof collapses and snow shoveling were the main culprits.

That's right. Snow shoveling.

One of the most tragic deaths [occurred in New Jersey](#) [4], where 64-year old Mary Wall was found dead in front of her home days after the storm passed. Her body was covered by over a foot and a half of snow when a group of middle school students found her lifeless body, with her fists still clenched around her shovel.

But while we are able to make sense of such tragedies incited by freezing temperatures, icy roads and structural damage, what is less clear is this: How does a seemingly healthy individual collapse and die of a heart attack from shoveling snow?

As we all know, snow is heavy. But what we may not realize is that snow shoveling is a very complex, multi-joint movement that requires coordination of both the upper and lower body musculature to perform the task. Studies show that the average heart rate during just 10-minutes with a shovel [can spike as high as 173 beats per minutes](#) [5]. For a man at the young age of 40, this represents 96 percent of his aerobic capacity. What this means is that the physiological demand is extremely high equivalent to that of sprinting on a treadmill at top speed.

Blood pressure also rises markedly when hauling loads of snow. For healthy albeit sedentary

individuals reports have shown that the systolic pressure (the number that represents the strength of the heart as a pump) rises dramatically after just a few heaves. And although blood pressure is *supposed* to rise during physical exertion, this sudden spike is dangerous because it puts individuals in a transient hypertensive state.

Further complicating the issue is restricted breathing, or specifically, what is called the [Valsalva Maneuver](#) [6]. Also, referred to as simply the "Valsalva," the move is an unintentional side effect of lifting heavy loads, where an individual forcefully exhales against a closed glottis. When this part of the airway passage is blocked (like when you hold your breath), blood pressure rapidly declines and then just as quickly rapidly increases causing one's blood pressure to soar. If blood pressure spikes high enough, cardiac events such as a heart attack or stroke can quickly follow.

So, don't be fooled by the seemingly deceptive and carefree white flakes. The energy demand and physiological responses to snow shoveling should not be underestimated, and there are a couple of things that you can do to lessen the risk of death while shoveling for you or or your loved one.

First, make certain to maintain even breathing to prevent the action and consequences of the Valsalva maneuver.

Second, don't wait until it stops snowing to begin shoveling. Rather, space out shoveling over the course of the day. This means lighter loads, which translates into less cardiac demand, and thus, less risk of a heart attack.

Third, if you are at all in doubt as to whether you might have an underlying heart condition such [risk factors include older age, hypertension, sedentary lifestyle, smoking, obesity and high cholesterol](#) [7] have someone else help, or have them do the shoveling for you. A neighbor. A friend. A friendly snowblower. It might cost you, but in the end, you'll want to be around for the next snowfall.

COPYRIGHT © 1978-2016 BY THE AMERICAN COUNCIL ON SCIENCE AND HEALTH

Source URL: <https://www.acsh.org/news/2016/01/27/79563>

Links

[1] http://acsh.org/wp-content/uploads/2016/01/shutterstock_111923474.jpg

[2] <http://www.weather.com/storms/winter/news/winter-storm-jonas-forecast-blizzard-warning-january-22>

[3] <http://www.weather.com/storms/winter/news/winter-storm-jonas-impacts-news>

[4] <http://www.nbcnewyork.com/news/local/Dead-Woman-Found-Snow-Shovel-Hand-Mahwah-New-Jersey-366465381.html>

[5] <https://www.nlm.nih.gov/medlineplus/magazine/issues/winter10/articles/winter10pg10a.html>

[6] <http://www.ncbi.nlm.nih.gov/pubmed/6565684>

[7] <https://www.acsm.org/public-information/articles/2012/01/19/risk-factors-for-cardiovascular-disease-where-do-you-fall->