



DECOMPRESSION SICKNESS — ‘THE BENDS’

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Decompression sickness (DCS) can occur anytime someone transitions too suddenly from an area of high pressure to an area of low pressure. Although more commonly considered in cases like scuba diving, other examples of settings that may induce decompression sickness include working to build an underground tunnel, spending time in a hyperbaric chamber, or underwater construction (caisson worksites) such as piers, bridges, or other waterfront structures. DCS also occurs when transitioning from areas of normal pressure to very low pressure, like ascending quickly to upper levels in the atmosphere when climbing a mountain or taking off in an airplane that does not have a properly pressurized cabin. One of the most common causes of DCS occurs when divers fly shortly after surfacing from their underwater activities.

What is Decompression Sickness?

Decompression sickness is also referred to as “the bends.” It can be painful, cause neurologic symptoms, or both. Classically, “the bends” describes joint pain that’s normally felt in the shoulders, knees, elbows, and ankles. DCS is caused by the release of gas into blood and tissues when there is a significant pressure change. Under Henry’s Law of physics, the ability for a gas to remain in solution is directly related to the pressure of that gas at the surface of the solution. This law also explains why a carbonated drink will release bubbles once the pressured container is opened.

Symptoms of DCS occur within 24 hours of the individual experiencing the pressure change. Most people affected by DCS will start having symptoms within the first six hours after the pressure change. Mild symptoms may manifest as joint pain, fatigue, poor appetite, swelling in the limbs, skin rash, and headache. Serious symptoms involve the nervous system and breathing. These may include numbness, tingling, weak muscles, loss of bladder or bowel control, confusion, slurred speech, coma or even death.



How can I avoid decompression sickness?

Certain factors can increase the risk of developing DCS. These include:

- › Dehydration
- › Fatigue
- › Alcohol consumption
- › Obesity
- › Older age
- › Cold-temperatures
- › Exercise after the high-pressure exposure
- › Flying after diving (within 24 hours)
- › Diving very deeply or for a prolonged period of time
- › Repeat exposure to the high-pressure environment in less than 24 hours

As you can see, many of these risk factors are modifiable. If your work requires you to dive or otherwise expose yourself to significant pressure change, you can decrease your risk for DCS by maintaining a healthy weight, getting adequate rest, limiting depth and duration of dives, and avoiding exacerbating the variations in pressure by timing your flights or dives appropriately.

If you ever suffer from decompression sickness, you should seek care right away. Tell your healthcare provider about the conditions of your environment leading to your symptoms. For example, you should find out the mix of gas used for deep sea diving, and approximate depth of the dive. Your provider may get imaging such as MRI, CT scan, and/or chest xray. The treatment for DCS involves use of a hyperbaric chamber, supplemental oxygen, and administration of IV fluids.

1. Decompression Sickness: <https://www.merckmanuals.com/professional/injuries-poisoning/injury-during-diving-or-work-in-compressed-air/decompression-sickness>
1. Decompression Sickness: <https://www.ncbi.nlm.nih.gov/books/NBK537264/>
1. Compilation of Henry's law constants (version 4.0) for water as solvent: <https://acp.copernicus.org/articles/15/4399/2015/acp-15-4399-2015.pdf>