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## Laughing gas: a risky 'party drug'

Capsules and cylinders containing laughing gas can now be purchased in many online shops, petrol stations and kiosks. They are officially sold for use in whipping cream. Yet, some people use laughing gas primarily as a 'party drug' because inhaling it causes hallucinations and euphoria. However, consuming laughing gas can cause serious health problems and, in extreme cases, even be fatal. The German Federal Institute for Risk Assessment (BfR) strongly advises against this kind of misuse.

Using laughing gas often leads to adverse toxicological effects like headaches, dizziness, tingling in the arms and legs, confusion and nausea. As no oxygen enters the body when laughing gas is inhaled, it can also lead to unconsciousness and even permanent brain damage in severe cases. There have also been reports from the Netherlands of deaths linked to laughing gas use.

When used as an intoxicant, laughing gas is typically transferred into balloons before use and then inhaled. In some cases, laughing gas is also inhaled directly from the capsules or from the cylinder. Because of the extremely low temperature of the released gas, this can cause cold burns to the fingers and lips. The expansion of the compressed gas and the resulting high pressure can also lead to severe irritation and injury to the respiratory tract, such as lung rupture.

Excessive consumption also carries the risk of permanent neurological damage, as nitrous oxide disrupts the body's metabolism. This can lead to symptoms such as paralysis, numbness, especially in the feet, and walking difficulties.

Laughing gas is the colloquial term for the compound nitrous oxide (N2O). It is a colourless gas with a slightly sweet smell and taste. In the food industry and catering, it is used to whip cream, for example in a cream whipper or cream dispenser. Due to the small amounts of laughing gas used in this process, no adverse health effects are expected from the usual consumption of such foods. Due to its anaesthetic and pain-relieving effects, laughing gas is also used as an anaesthetic, especially in dentistry. When used for short periods under medical supervision, laughing gas is considered to have virtually no side effects.

Shortly after its discovery in 1772, laughing gas was already being used for recreational purposes at fairs and during 'laughing gas parties'. In recent years, there has been a resurgence in its use as a 'party drug' in some European countries. As a result, the sale of laughing gas capsules to minors—and in some cases, also to adults—has been banned or heavily restricted in countries like the United Kingdom, the Netherlands, Belgium, France and Denmark.

There is currently no reliable data available on the use of laughing gas in Germany. However, various German poison centers have reported an increase in the number of calls related to accidental poisoning involving laughing gas. Between 2010 and 2015, the Berlin Poison Control Center reported between one and two cases per year. In 2022, there were already seven cases, with 20 reported for 2023. So far, these have been mostly mild to moderate cases, with only a few serious cases. In 2024, 50 cases of nitrous oxide poisoning were recorded. The majority of those affected were adolescents and young adults (36 cases), mostly with mild to moderate symptoms.

Studies from neighbouring European countries demonstrate that the consumption of laughing gas can also lead to serious and permanent health damage. In the greater Paris area, a total of 181 patients with severe laughing gas poisoning were recorded between 2018 and 2021, some of whom suffered severe damage to the spinal cord or other parts of the nervous system.

The neurological damage is caused by a disruption in the metabolism of vitamin B12. Laughing gas reacts with vitamin B12, which is usually absorbed through food, rendering the vitamin inactive. As vitamin B12 is important for the development of nerve cells and blood formation, this can lead to paralysis and numbness, as well as a specific form of anaemia.

Due to the potential health risks, the BfR strongly advises against the use of laughing gas as a recreational drug. If health problems occur, a doctor should be consulted immediately and the consumption of laughing gas openly addressed. Since damage to the nervous system causes different symptoms that are often difficult to classify at first, information about consumption can be crucial for a quick and correct diagnosis.

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