

Frequently Asked Questions about Water Pipes

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The smoking of water pipes, also called shishas or hubble-bubbles, is popular amongst adolescents and young adults. It is often assumed that smoking water pipes is far less harmful than smoking cigarettes. But this is certainly not the case: water pipes are not a harmless alternative to cigarettes. In fact, the addiction and health risks are similarly high when it comes to water pipe smoke. Because of the sparse data available on the effects of smoking water pipes, only initial work on a risk assessment is possible at the present time. The Federal Institute for Risk Assessment (BfR) has compiled Frequently Asked Questions on water pipes.

Is smoking a water pipe just as harmful as smoking cigarettes?

Water pipe smoke and cigarette smoke contain the same harmful and addictive substances nicotine, tar and carbon monoxide. The far lower temperature in the tobacco of a water pipe compared to cigarettes does not mean that the smoke contains no or only low levels of contaminants. Higher levels of some contaminants like nicotine or metal ions are even found in water pipe smoke than in cigarette smoke.

If one compares the average water pipe smoker who smokes one to two water pipes a week with an average cigarette smoker who smokes 20-30 cigarettes a day, then smoking cigarettes must definitely be seen as more harmful. However, based on the knowledge currently available the health risks are similar for water pipe smokers who smoke two to three pipes of tobacco a day.

Water pipe consumption spanning several years can lead to a worsening of pulmonary function and increases the risk of tumours. Furthermore, women who smoke water pipes during pregnancy run a higher risk of giving birth to babies with a low birth weight.

Can you become addicted to smoking water pipes?

The ingredient nicotine in tobacco is responsible for the addictive effect of water pipes – just as it is with cigarettes. The intake of high levels of nicotine and the related risk of addiction are one of the biggest problems when it comes to smoking water pipes according to the current level of knowledge.

Do you take in the same amount of contaminants when you smoke a water pipe as you do when you smoke a cigarette?

It is difficult to compare the amounts: a water pipe is filled with between 5 and 10 g tobacco, a cigarette only contains around 0.7 g tobacco. About eight puffs are taken from one cigarette, between 100 and 200 from a water pipe. Average consumers in Germany smoke between one and two water pipes a week and between 20 and 30 cigarettes a day.

How many cigarettes correspond to a water pipe?

There is no simple answer to that question. At the present time, there are two comparison methods. One method is based on smoke volume, the other on the amount of excreted cotinine. (Cotinine is generated in the human body as a degradation product of nicotine.)

A WHO working group compared the smoke volumes inhaled by cigarette smokers and water pipe smokers. They came to the conclusion that a water pipe smoker who smokes a water pipe inhales a smoke volume that corresponds to the volume inhaled by a cigarette smoker when he smokes 100 cigarettes. However, it is the opinion of the BfR, that this com-

parison is unsuitable firstly because it could lead to the misleading impression that a water pipe was as dangerous as 100 cigarettes. Secondly, robust comparisons are only possible on the basis of ingested smoke ingredients.

The second comparison stems from an evaluation of various studies on the excretion of cotinine. Based on this evaluation, the following classification is possible:

- Daily water pipe consumption (one water pipe per day) leads to a cotinine level in 24-hour urine that corresponds to the consumption of 10 cigarettes a day.
- Occasional water pipe consumption (one water pipe every four days) leads to a cotinine level in 24-hour urine that corresponds to the consumption of two cigarettes a day.

BfR believes that this comparison, in contrast to the above-mentioned comparison of smoke volumes, is more robust and, therefore, acceptable. No data are available on the other smoke ingredients. Here, there is a need for research.

What harmful substances are absorbed from water pipe smoke?

Newer studies on the composition of water pipe smoke show that it contains high quantities of carbon monoxide, benzene, nicotine and tar. In addition, polycyclic aromatic hydrocarbons (PAHs), tobacco-specific nitrosamines (TSNAs), primary aromatic amines (PAAs), humectants such as glycerine and 1,2-propanediol as well as carbonyls were detected. Some representatives of these contaminant groups, for example benzo[*a*]pyrene (PAK), N'-nitrosonornicotine (TSNA) and 2-naphthylamine (PAA) are definitely carcinogenic. Furthermore, there are indications that carcinogenic metal ions such as arsenic, chromium and nickel are present in the smoke of water pipes. Studies on the breakdown products of nicotine and carbon monoxide in the human body showed that water pipe smokers absorb considerable quantities of these harmful substances, in the case of carbon monoxide even significantly more than cigarette smokers.

Does the smoke of water pipes also contain tar?

Studies show that water pipe smoke can contain considerable amounts of tar. Tar is formed during the burning of tobacco in the cigarette or during heating in the water pipe. Due to the clear temperature difference between a cigarette and a water pipe, the composition of the tar is different too, however. Thus water pipe tar contains, apart from PAHs, TSNAs and PAAs, the humectants glycerine and 1,2-propanediol. However, the studies on the precise composition of water pipe tar have not been completed yet.

Which ingredients must be listed on the packaging of tobacco for water pipes?

The amounts of carbon monoxide, tar and nicotine in cigarette smoke must be stated on cigarette packs. There are standardised methods for measuring those substances. By contrast, there are still no standardised methods for examining water pipe smoke. The nicotine content in the tobacco is indicated on the packaging of water pipe tobacco. Wording on the packaging of water pipe tobacco with statements like "Contains 0 g tar" are misleading for consumers as tar is only formed from tobacco when it is heated or burned.

Do water pipes have better filters than cigarettes or does water "dilute" the contaminants in the smoke?

Unlike most cigarettes, water pipes don't have any filters at all. Even though some water-soluble substances contained in the water pipe smoke are partially filtered when they pass through the water, this effect is, in the estimation of the BfR, insufficient to protect water pipe smokers from health risk, since they can absorb significant amounts of contaminants overall.

Can infectious diseases be transmitted through the smoking of water pipes?

Water pipes are very frequently smoked by several people. The transmission of pathogens like tuberculosis bacteria or *Helicobacter pylori* germs, which trigger gastritis, is not unlikely, though so far no evidence based on experiments exists. The use of disposable mouthpieces can prevent the risk of infection via this path.

Why is the humectant content in water pipe tobacco in Germany restricted to five percent?

In Germany, the tobacco regulation limits the humectant content in water pipe tobacco to five percent. An experimental study conducted by the BfR shows that humectants such as glycerine or 1,2 propanediol for the most part evaporate during smoking and can thus be absorbed to a significant degree by the smoker. In animal experiments, inhaling high concentrations of glycerine or 1,2 propanediol led to changes to the cell epithelium in the larynx or to irritation of the nasal mucosa. The BfR therefore maintains its recommendation to limit humectant contents in water pipe tobacco to a maximum of five percent.

Does the burning of water pipe charcoal lead to health damage?

In contrast to cigarettes tobacco in the water pipe is not burned directly but charred at low temperatures. To heat up the tobacco, water pipe charcoal is used. This char therefore also contributes to the composition of the smoke. When the char is burned, considerable amounts of carbon monoxide, benzene and PAHs are formed which are then absorbed by the water pipe smoker. It makes no difference whether self-igniting or unprocessed charcoal is used for the water pipes. In general, the more char is used in a smoking session the higher the possible intake of these harmful substances.

Are there groups of people who should not smoke a water pipe under any circumstances?

BfR advises in particular individuals with cardiovascular diseases or pregnant women against smoking water pipes. The reason for this recommendation is the high level of exposure of water pipe smokers to carbon monoxide.

Are non-smokers exposed to health risks in shisha cafes?

This question must be examined in future as initial experimental studies have identified high fine dust concentrations and high carbon monoxide concentrations on premises where water pipes were smoked. BfR has, therefore, recommended to the competent authorities and the responsible parties (shisha cafe operators) that they take measurements in shisha cafes and issued a warning to pregnant non-smokers about not spending long periods in shisha cafes until the situation has been clarified.

What does BfR recommend?

Given that more and more people are smoking water pipes in Germany, the Institute carried out various studies on possible health risks from the water pipe. An urgent problem is the release of carbon monoxide which can be absorbed by smokers in high quantities. The BfR therefore urgently recommends that measurements be taken of the carbon monoxide levels in the indoor air of shisha cafes in order to clarify the health risks for employees and customers.

In order to be able to indicate the ingredients in smoke on the packaging of water pipe tobacco, standardised parameters must be developed in future for measuring the content of toxic ingredients. In conjunction with raising health awareness, attention should be drawn not

only to the health risks from smoking cigarettes but to also to the risks linked to the smoking of water pipes.