



What is the difference between smoking and vaping cannabis?

Cannabis compounds present in the native plant occur as acid structures that have no biologic effect in the human body: THC-A, CBD-A, CBN-A, CBC-A, CBG-A, etc. For the acid component to be broken off and for the chemicals to become activated, heating is required.

When cannabis compounds are heated by flame such as in a bowl, water pipe (bong), or cigarette (joint), very high temperatures are produced (> 450°F) which combusts not only cannabis compounds but also undesirable and potentially harmful plant material including cancer-causing chemicals such as benzene and tar which are also breathed into the lungs with the smoke. While using a water pipe offers theoretical advantages by using water to filter out harmful plant compounds from the smoke, they may also harmfully trap these toxins in water droplets which are inhaled into the lungs. The risks of regular smoking of cannabis flower are underscored by recent research showing that regular cannabis users have higher rates of emphysema than regular cigarette smokers as smoking cannabis is equivalent to regularly smoking unfiltered tobacco cigarettes¹. For these reasons, **the Medical Cannabis Institute does not endorse the consumption of cannabis compounds by smoking.**

On the other hand, when cannabis is vaped by heating in a vaporizer device or by vaporizing cartridges of cannabis oil, the cannabis is boiled, and cannabinoids are released at lower temperatures (280-360°F) that are too low to release the potentially harmful plant materials. In a sense, when vaping, the cannabis compounds are released as a cannabis vapor rather than a smoke containing cannabis and harmful plant materials. There are three main ways that cannabis can be vaped.

Tabletop Vaporizers: Use dried cannabis flower (bud). While expensive, these devices offer the most advanced technology by allowing a user to set the specific temperatures they want to heat cannabis flower. Because every cannabinoid and terpene are known to boil and be released at different temperatures, these devices allow a user to specifically target those cannabinoids or terpenes they wish to receive. Most high-end devices will include detailed instructions on how to target different cannabinoids with various temperature settings.

Portable Vaporizers:

Used dried cannabis flower (bud). Like tabletop vaporizers, portable devices boil and vaporize dried cannabis flower. They are battery-powered and come in various sizes, levels of complexity (ability to set temperatures), and expense.



Vape Pens: Use cartridges of cannabis oil. While less expensive and simpler to use, these pen-like devices do not allow one to set the desired temperature. Although there were safety concerns with vaporizer pens in the past, it turns out the cases of severe pneumonia and death were caused by the use of unregulated black-market cartridges which were cut with harmful vegetable oils. In states with medical cannabis programs, the purity of vape cartridges is ensured by state oversight and vigorous independent lab testing.



When is vaping recommended? Because it is rapidly absorbed into the body through the lungs into the bloodstream, vaporized cannabis has a quick onset of action (8-15 minutes) and generally lasts 2-4 hours before wearing off. When using vape pens, the dose is harder to control, and it can tend to deliver higher doses than are necessary. Therefore, when products containing THC are vaped, it can be challenging to avoid some degree of intoxication. For this reason, the Medical Cannabis Institute recommends that vaping be used only for the control of acute breakthrough symptoms or to induce sleep. Long-term control of chronic pain or inflammation and/or maintenance of sleep is better accomplished by using oral cannabis products (tinctures/oils, edibles, tablets, or capsules) which have a slower onset but much longer duration of action and doses that are easier to specify and control.

¹ Chest CT Findings in Marijuana Smokers. Luke Murtha, Paul Sathiadoss, Jean-Paul Salameh, et al. *Radiology*. Vol 307, No. 1