# THC

Tetrahydrocannabinol (THC) is one of many cannabinoids in the Cannabis sativa plant and is the primary psychoactive cannabinoid constituent. THC can be obtained for recreational licit and illicit use or medical use as an appetite stimulant, antiemetic, antispasmodic, and in the treatment of epilepsy and glaucoma.[1,2]

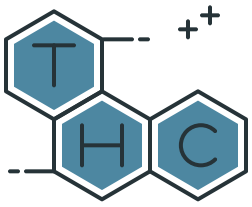
THC is most commonly used via inhalation, this method bypasses first pass metabolism allowing for rapid absorption and an immediate effect or 'high'.[3] On the other hand, oral consumption (aka edibles) undergoes extensive hepatic first pass metabolism lowering THC concentrations relative to inhalation.[4] Lastly, transdermal use bypasses first pass metabolism, but the hydrophobic nature of skin limits diffusion into systemic circulation and is typically effective for localized area of treatment.[4]

THC produces physiological effects such as sedation, euphoria, hallucinations, and temporal distortion.[2] Due to interactions with receptors in the brain, THC has also been associated with cognition, memory, reward, anxiety, pain sensory perception and motor coordination.[5] THC may elicit significant pharmacodynamic interactions as well when administered with additional CNS depressants.[4]

Concentrations of THC initially rise rapidly and peak before a rapid fall as THC is redistributed, until a baseline is reached.[6] THC is highly lipophilic substance, distributed in lipid containing tissues such as adipose tissues, brain and muscles.[4,6] Therefore, THC elimination can be affected by chronic use as well as body size and composition, due to slow redistribution from deep compartments of adipose tissues and/or reabsorption of THC and metabolites via entero-hepatic circulation.[6]

The parent drug is detected directly in oral fluid, whereas the major metabolite, 11-nor-9-carboxy-THC (THCA), is measured in urine.[2,5] The half-life of THCA in urine exhibits variability with longer elimination observed in heavy users due to slow redistribution.[4] In oral fluid, THC detection can be a result of oral contamination due to inhalation or oral consumption and may persist due to ion trapping because of the lower pH in saliva.[7]

Precision diagnostics offers definitive tests for both urine and oral fluid as well as, presumptive and reflex tests for urine. Due to variabilities in pharmacokinetics of THC (i.e. absorption, distribution, metabolism, and elimination) it is a challenge to differentiate acute versus chronic use.

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