

MARIJUANA

“INFORMATION SHEET” for professionals

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Appearance: Marijuana is derived by the flowering hemp of Cannabis Sativa. It is commonly found in the form of crude dried and green-brown mixture of shredded flowers, leaves, stems and seeds of the hemp plant.

Synonyms: Usually it is called cannabis, but street-names such as, grass (or “bar” in Albania), herb, hash, bud, weed, m.j, etc, are frequently used among users.

Methods of use: The main method of use is smoking, as a self-prepared and self-administered hand- rolled cigarette (called joint), as a cigar (called blunts) where tobacco is removed and replaced with marijuana, or as water pipes (called bong). It can be also taken orally; mixed with food, in baked cookies and brownies, as cannabis tea or as tablets (Marinol) for therapeutic purposes.

Drug Class: Marijuana is classified as psychogenic drug and belongs to Schedule Ist Controlled Substance (The Controlled Substances Act of 1970).

Medical Uses: Currently the medical use of marijuana is limited, mainly due to the cannabinoid potency. However, Marinol (dronabinol) is approved and being used in treating nausea and vomiting after chemotherapy among patients with cancer, improving appetite of AIDS’s patients who has developed the “wasting syndrome”, or in treating other disorders, such as: glaucoma, multiple sclerosis, chronic pain, etc.

Recreational Uses: marijuana is chiefly used for its positive and pleasurable effects, which include feelings of euphoria, relaxation, mood and sensation altering.

Potency, Purity and Dose: delta-9-tetrahydrocannabinol (THC) concentration in marijuana varies from 0.5% - 5.0%, but its potency varies greatly. For instance, the THC content in “sinsemilla”, which derives from the flowering top of the hemp plant, ranges from 7.5% up to 24%. A hand-rolled cigarette contains 0.5-1.0 gr cannabis, whereas the THC content in those cigarettes fluctuates from 5-150 mg. The actual amount of THC delivered in the smoke has been estimated from 20% to 70% (Hawks, 1982). Small amounts of marijuana (2-3mg THC) are quite enough to produce the pleasurable effects, mainly to occasional users. However, different studies indicate that potency and purity of marijuana is increased when compared with two decades ago, due to its different methods of cultivation.

Route of Administration: The common route of marijuana administration for recreational purposes is through inhaling. Smoking (joint, blunt, water pipe) is the most likeable way of administration as the intense “high” is reached quickly due to rapid onset. Less frequently, ingesting is used as a route to receive pleasurable effects. Oral administration, also is being

used for receiving dronabinol, which is a synthetic form of THC (Marinol) legally approved for therapeutic use.

Whereas, intravenous administration of marijuana is very difficult to be used, due to marijuana's water insolubility.

Pharmacodynamics: Cannabis has more than 60 compounds with psychoactive properties, known as cannabinoids, where THC is the major compound that owns the most psychoactive properties. There are two cannabinoid receptors, CB1 primarily found in the brain and CB2 found in the immune system. The psychoactive effects of THC are produced by CB1 receptor activation which belongs to G-protein coupled receptor family. Thus, receptor activation results in cAMP inhibition, it opens potassium and it closes the calcium channels, causing decrease in the neurotransmitter release and it produces the effects that are associated with marijuana usage.

Pharmacokinetics: The fastest way of THC's absorption is through smoking. Almost all the amount of inhaled marijuana is absorbed into the lungs, then travels in the blood and quickly reaches the brain. Blood plasma level of smoker is raised and euphoriant effects are produced in less than a minute and last from 1-3 hours. Once the peak level is reached, the plasma concentration starts to drop down as a result of liver metabolism process and the accumulation of fatty tissues. Quite in contrary with smoking, the oral administration has a slower onset but longer duration. The bioavailability is reduced due to the degradation in the stomach and first-pass metabolism. In this case, the effects are felt after ½ - 2 hours and can last more than four hours. THC is also distributed to other tissues throughout the body and it is easily accumulated in the fatty tissues due to its lipid soluble properties. THC has considerably a long half-life and its peak concentration can be reached in approximately 4-5 days. The half-life of THC from tissues elimination is around 7 days, whereas complete elimination may last up to 30 days. The metabolism of marijuana depends on the routes of administration. In the case of smoking, the metabolism happens in the lungs; when it is ingested the metabolism happens in the liver. THC is metabolized through the cytochrome P450 system and the main metabolite is 11-hydroxy-THC, which is more potent than other metabolites and even more than THC itself. The metabolites excretion is carried out mainly through faeces (~75%) and partially through the urine.

Molecular Interactions / Receptor Chemistry: The metabolism of marijuana is carried out mainly in the liver, through different pathways including via cytochrome P450.

Effects: The effects of marijuana are dose-related and individual, hence both psychological and physiological effects vary from users to users. Factors such as, route of administration, previous experiences, expectation and settings also play an important role in perceiving the effects of marijuana. At recreational doses, the "high" from marijuana produces feelings of euphoria, relaxation, calmness, well-being or grandiosity, disconnection from the real life, increased sensitivity to sensory stimuli and sexual pleasure. Marijuana increases the blood flow to the skin and users feel warmth or flushing, increased heart rate and dilatation of blood vessels in the eyes (redness). While at very high doses, users may experience paranoia, hallucinations and other psychotic reactions.

Side Effect and health risks: Impairments in memory, attention, and ability to process information, time sense and learning are common among users. Evidences show that

young people who start smoking marijuana have poor school performance, are aimlessness or lack the motivation of achievement. These symptoms are called “the amotivational syndrome”. Less often marijuana users report panic, paranoia, anxiety, dizziness and nausea. Health risks of chronic use include: respiratory and pulmonary damage, cardiac, reproductive and immune system impairments and teratogenic effects on fetus.

Duration of Effects: The effects of marijuana appear within a few minutes after the first “joint” and can last up to three hours. At oral ingestion, the effects are felt approximately within the first hour, but last longer for more than four hours. But, the “high” feeling can be decreased long before THC has been eliminated from the user’s body, due to storage in the fatty tissues.

Tolerance, Dependence and Withdrawal Effects: Like with other psychoactive drugs the tolerance depends on the individual characteristics, dose, duration, exposure and metabolism. In comparison with other psychoactive drugs, the tolerance from marijuana is milder. The mechanism of marijuana’s tolerance is direct related with the receptor regulation process. Dependence state develops at regular users and it is presented with difficulties to stop the use, craving and withdrawal symptoms. Most of the withdrawal symptoms are behavioural rather than physical and do not include severe physical symptoms usually associated with opiates, such as: pain, nausea, heavy sweating, and cramps. Typically, the symptoms are the opposite of euphoriant effects produced by marijuana, consisting of restlessness, irritability, sleep disturbances, decreased appetite, depression and tremor.

Drug Interactions: Smokers, often use marijuana with other drugs, such as: alcohol, sedatives or stimulants to enhance the effect of the drug. The combination of marijuana use with alcohol is more common among users, as both drugs have almost similar action. At low doses this interaction produces euphoria and relaxation, while at high doses it produces sedation.

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