



Clinical Update: October 2019

What did my patient actually take? An Overview of Marijuana (THC) Results

Marijuana Overview

The interpretation of marijuana results differs when considering presumptive vs. definitive testing methods, and may also differ among laboratories. The information provided here is intended to assist providers with deciphering positive THC/marijuana results from Aegis, which have undergone definitive testing by gas chromatography/mass spectrometry (GC/MS) prior to reporting.

Marijuana is the most commonly used or misused drug and is used by 84% of current illicit drug users. A national survey found that 1 in 10 individuals aged 12 or older have used marijuana in the past month. ¹ Cannabis is the drug with the highest prevalence in cases involving driving under the influence of drugs and the source of more positive results in workplace drug tests than any other drug of abuse. ²

Period of Detection Considerations

The detection time for marijuana in urine depends heavily on the body composition of the patient and the frequency of use. Daily use of marijuana is expected to be detectable in urine for a period up to 10 days; light use (such as one joint) may only be detectable for up to 3 days. ³ One study demonstrated that 73% of 37 chronic marijuana users had THC concentrations below a cutoff of 15 ng/mL within two weeks of last ingestion. ⁴ Patients with a large amount of adipose tissue may store marijuana and excrete metabolites for a longer period of time, especially after abnormally heavy use over a chronic period. In such rare cases, marijuana has been reported with a period of detection up to 30 days, with the longest period published as 95 days. Such a period of detection is the exception, not the rule. ^{3, 5-6}

Oral Fluid Considerations

Marijuana positives in oral fluid are generally due to a depot effect after smoking, which limits interpretation to recent use. ⁷ Passive inhalation of marijuana is also unlikely to cause a positive test in oral fluid at typical laboratory thresholds, except in circumstances of heavy smoke exposure, long duration of exposure, lack of ventilation, and if exposure occurs on the same day as sample collection. ⁸⁻⁹

Ingestion of dronabinol (Marinol[®]) is unlikely to cause a positive test for THC in oral fluid at a two ng/mL threshold, which is used at Aegis. ¹⁰ Oral ingestion of THC produces lower and later peak blood concentrations and effects than smoked THC, and only 6-20% of an orally administered dose reaches systemic circulation. ¹⁰⁻¹¹ Using oral fluid as a specimen type may, therefore, be beneficial when assessing patients who claim to ingest Marinol[®] to explain marijuana positives in urine.

Marijuana False Positives on Immunoassay

Immunoassay, or point of care testing, has the highest risk of false positives among all testing methods ⁶. The following medications and over-the-counter products have chemical structures similar enough to THC to trigger a presumptive positive result that would not confirm via GC/MS on an Aegis test: Acetylsalicylic acid, baby wash/soaps ¹², efavirenz ^{6, 13}, NSAIDs (ibuprofen, naproxen) ¹⁴⁻¹⁵, proton pump inhibitors (pantoprazole) ^{6, 16}, tolmetin ¹⁷, and more.

Marijuana False Negatives on Immunoassay

People using marijuana often attempt to tamper urine samples to produce negative results. Addition of Visine® eyedrops to urine samples has been shown to cause false-negative results for THC. Chemical analysis of Visine® eyedrops has shown that the ingredients, benzalkonium chloride and the borate buffer, can directly decrease the concentration of 9-carboxy-THC in the urine with no effects on the antibodies in the immunoassay. However, these ingredients do not chemically alter 9-carboxy-THC, which will still be detected by GC-MS.^{15, 18}

Cannabidiol (CBD) Products

Cannabis contains nearly 500 cannabinoid compounds, the most widely studied being THC and CBD. THC is responsible for the characteristic “high” of marijuana, while CBD has not been shown to have the same cognitive effects. CBD has been studied as a treatment for multiple disease states and health conditions, including bipolar mania, Huntington’s disease, inflammation, insomnia, multiple sclerosis, nausea, social anxiety disorder, schizophrenia, and seizures. Prescription cannabidiol (Epidolex®) was developed to contain negligible amounts of THC; thus, it is unlikely to cause a marijuana positive.¹⁹

Although CBD itself will not be detected as THC on a urine drug test, it is possible for CBD products to contain THC given both are extracted from the marijuana (Cannabis) plant. The product descriptions “medical marijuana”, “high CBD,” and “low THC” are often used interchangeably, and no standard definition exists for these individual terms.

The legal limit for the amount of THC allowed in CBD products is variable, ranging from 0.3% to 5% depending on state-specific regulations.²⁰ Importantly, the manufacturing and purification processes for CBD products are not regulated by the Food and Drug Administration (FDA), leaving little opportunity for mandated CBD to THC ratios to be enforced.²⁰⁻²¹ THC content varies among unregulated hemp and cannabidiol products; the ability of these products to cause a positive marijuana result will depend on the amount of THC present in the product, the amount and frequency of the ingestion, and individual patient pharmacokinetics.²²⁻²⁴ Given these factors, it is possible for the use of a CBD product to result in a THC-positive urine drug test. It is vital that healthcare providers use caution when recommending or reviewing CBD products for patients due to little regulation and inaccurate labeling of quantities within products.²⁵

To be inclusive of all states’ regulations and possible causes for positive marijuana results, Aegis has combined the marijuana and Marinol® compliance calls on the urine lab report to read as “Marijuana/Marinol®” with the comment mentioning CBD- and hemp-containing products as shown in *Figure 1* below.

Figure 1

Marijuana/Marinol	PRESENT	127 ng/mL	Test result may be due to ingestion of dronabinol, marijuana, or, in rare cases, use of a CBD- or hemp-containing product.
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Please call our clinical team at 1-877-552-3232 if you require additional information.

NOTICE: The information above is intended as a resource for health care providers. Providers should use their independent medical judgment based on the clinical needs of the patient when making determinations of who to test, what medications to test, testing frequency, and the type of testing to conduct.



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