



Hair Drug & Alcohol Test Interpretation



Psychemedics pioneered the use of hair testing over 30 years ago, after years of research proved that drugs deposited in the hair can be accurately measured. Hair analysis is a test in which a sample of a person's hair is sent to a laboratory to detect illicit drug use.

The technology capitalizes on the way the body metabolizes ingested drugs as they flow through the blood stream and deposit in the cortex of the hair. Hair is stable and the deposits are permanently embedded in the hair, so hair acts like a tape recorder — “recording” drug deposits in proportion to the use over time as drugs are deposited in proportion to use.

The two tests used by Psychemedics to analyse hair samples for the presence of drugs of abuse are an FDA-cleared immunoassay test followed by confirmation by mass spectrometry (MS/MS in most instances).

Brassets Group act as the Third Party Administrators for Psychemedics Hair Drug and Alcohol Tests throughout the Asia Pacific Region. Brassets Group provide specialist medical services and medical transports throughout the world.

AWDTS consists of forensic practitioners who have spent their professional lives in drug and alcohol testing. They have vast experience in detection, prevention, counselling and rehabilitation pertaining to drugs & alcohol misuse and abuse.

On the following pages we offer information to assist with the interpretation of Hair Drug and Alcohol test results.

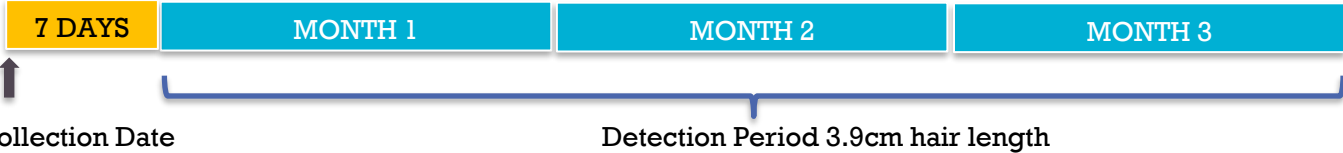
For more in depth analysis we provide a Toxicologists report from our Toxicologist for an additional cost if required.

DRUG & ALCOHOL TEST INTERPRETATION

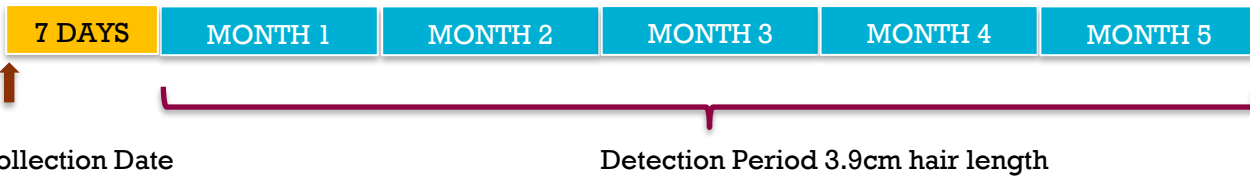
This document provides general information on the interpretation of a Psychomedics drug and alcohol hair test result.

DETECTION PERIOD OF THE TEST

- ▶ **Detection Period (HEAD HAIR)** - A standard hair test tests a 3.9cm length of hair. This equates to an approximate three (3) month detection period. Head hair grows at a rate of 1.3cm per month. Approximately seven (7) days of hair growth resides below the skin surface.



- ▶ **Detection Period (BODY HAIR)** - a standard hair test tests the entire length of body hair. This is determined by the length of the body hair. Body hair grows in three stages with a 3.9cm length providing up to an approximate five (5) month detection period.



CUT OFF LEVELS

- ▶ **Screening Cutoff** - The cutoff level is set to detect the present of drugs in an initial immunoassay. If detected the sample is then tested by triple mass spectrometry in a **Confirmation Cutoff**.
- ▶ **Confirmation Cutoff** - The Confirmation Cutoff is the level set to confirm the presence of drugs in the hair sample. These levels are set in accordance with the Society of Hair Testing. This level is set to detect when several ingestions have occurred.

Screening Cutoff	Confirmation Cutoff
5 ng/10 mg	5 ng/10 mg
	0.5 ng/10 mg
	0.5 ng/10 mg
	0.5 ng/10 mg

POSITIVE RESULTS

- ▶ **Positive Result** – We illustrated below a Positive drug test which illustrates the level of drug detected.

MARIJUANA	POSITIVE	
Cannabinoids/THC Screen		10 pg/10 mg
CarboxyTHC	Positive MS 27.1 pg/10 mg	1 pg/10 mg

POSITIVE RESULTS INTERPRETATION

- ▶ **Interpretation** – Illicit drugs vary in potency and dosage is not medically determined. A positive drug test cannot therefore determine how many times the drug was ingested. A “Sectional” drug test can section the hair into one month segments so we can identify the level of drug use month by month. (This incurs additional costs and must be specified at the time of collection).
The cut off levels are set to detect several ingestions, the higher the level detected the higher the level of ingestion. For more detailed information we can provide a Toxicologists report and more detailed information.



BrassetsGroup

Hair Test Interpretation

PSYCHEMEDICS CORPORATION
The Worldwide Leader in Hair Drug Testing

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HAIR ANALYSIS DRUG TEST RESULTS
Patented Technologies

Account : BRASSETS PTY LTD
Account ID : C0115151
Client Code : BRAADS
Location ID : 11478629
BRASSETS GROUP DRUG SAFE

Subject Name : Example, Stephen
Subject ID : XXX-XXX-AADS
CCF ID : V1234567
LAN : 123456789

Source : Head Hair
Reason for Test : Unknown
Collected : Jun 09, 2019 04:15 PM
Received at Lab : Jun 12, 2019 10:50 AM
Released by Lab : Jun 12, 2019 10:21 AM
Sample Length : 0 to 3.9cm

Test Panel : 819 Hair AM CO ET OPH TE

Test	Result	Screening Cutoff	Confirmation Cutoff
COCOAINE	NEGATIVE	5 ng/10 mg	5 ng/10 mg
Cocaine Screen	Negative		5 ng/10 mg
Cocaine	Negative		5 ng/10 mg
Benzoylcegonine	Negative		0.5 ng/10 mg
Cocacethylene	Negative		0.5 ng/10 mg
Norcocaine	Negative		0.5 ng/10 mg
OPIOIDS	NEGATIVE	2 ng/10 mg	2 ng/10 mg
Opiaes Screen	Negative		2 ng/10 mg
Codine	Negative		2 ng/10 mg
Morphine	Negative		2 ng/10 mg
6-MAM	Negative		2 ng/10 mg
Hydrocodone	Negative		2 ng/10 mg
Hydromorphone	Negative		2 ng/10 mg
Oxycodone Screen	Negative		2 ng/10 mg
Oxycodone	Negative		2 ng/10 mg
Oxymorphone	Negative		2 ng/10 mg
PHENCYCLIDINE (PCP)	NEGATIVE	3 ng/10 mg	3 ng/10 mg
Phencyclidine Screen	Negative		3 ng/10 mg
Phencyclidine	Negative		3 ng/10 mg
AMPHETAMINES	NEGATIVE	5 ng/10 mg	5 ng/10 mg
Amphetamines Screen	Negative		5 ng/10 mg
Methamphetamine	Negative		5 ng/10 mg
MDMA	Negative		5 ng/10 mg
MDEA	Negative		5 ng/10 mg
Amphetamine	Negative		5 ng/10 mg
MARIJUANA	POSITIVE	10 ng/10 mg	1 ng/10 mg
Cannabinoids/THC Screen	Positive MS 35.1 pg/10 mg		1 ng/10 mg
Carboxy/THC	Positive: LOW TO MODERATE 209 pg/mg		1 ng/10 mg
ALCOHOL	POSITIVE: LOW TO MODERATE 209 ug/100 mL		2 pg/mg
Ethyl Glucuronide MS Screen	Confirmed MS 11.0 pg/mg		2 pg/mg
Ethyl Glucuronide MS	Confirmed MS 11.0 pg/mg		2 pg/mg

Continued on next page.....

Test Performed by PSYCHEMEDICS Corporation
Tel: 800-522-7424 / 832 Uplander Way / 6100 Bristol Parkway, Culver City, CA 90230
Print Date: 06/17/2019 10:55:37 AM STN6-CL

ANAB
IAC-MSA
CAP
ACCREDITED

- Account:** The details here may vary depending on the collection agency. Brassets Group are the Administrators for Psychemedics in the Asia Pacific Region but we also have several laboratory certificated Doctors, Pathology and Drug Testing companies that we facilitate tests for.
 - Subject Name:** This is the Donors name
 - CCF ID:** This is the unique identifier for the Drug test. This number is on the "Chain of Custody Document" the "Sample Acquisition Card" and the Laboratory Result.
 - Source:** The Source is either "Head Hair" or "Body Hair"
 - Reason for Test:** This is often reported as Unknown, or Pre-Employment. The reason for this is to ensure a priority status at the Laboratory. If the reason is recorded as "Court" or "Legal" they are subject to USA legal processes that significantly holds up the Test.
 - Collected:** This is the date the Hair Sample was collected in Australian Time.
 - Released by Lab:** This is the date the result is released by the Laboratory in USA time.
 - Sample Length:** This is the length of hair that was tested at the laboratory (Not the sample length). Each test will test a 3.9cm length (Approx 3 month detection period) of Head hair or else the total length of Body Hair.
 - Confirmation Cutoff:** This is the cut-off level, a detection below this is reported as negative.
 - Screening Cutoff:** This is the cut-off level for the initial test (immunoassay)
 - Result:** This is the confirmed result confirmed by a certifying scientist.
 - Test:** This column lists each drug class tested and the specific metabolites tested.
 - Positive Drug Test Result:** All Positive drug test results are framed with a Blue header as illustrated in this sample report.
 - Positive Drug / Alcohol Test Level:** The level of the drug detected in the hair is stated. This is the accumulative amount of drug in the hair over the detection period.
- With Illicit drugs, the "Potency" and "Amount Ingested" are uncontrolled and subsequently vary significantly, therefore it is difficult to determine the frequency of use, or the amount ingested. The cut off levels are set to detect multiple ingestions of the drug during the detection period.
- THE LEVEL OF DRUG DETECTED in a POSITIVE drug test indicates multiple ingestions of the drug substance. For a scientific report on the drug test result Brassets Group Toxicologist can provide a report for an additional cost.**

DETERMINING FREQUENCY OR AMOUNT INGESTED

Determining the frequency and quantity used is not possible due to the large variation in potency and amounts ingested by different Donors.

A longer term addict will use substantially more substance than a person in early stages of addiction. What constitutes a high level for one Donor may be a medium level for another Donor. On this basis we do not generally provide a Low, Medium or High level use indication.

DETERMINING LOW MEDIUM OR HIGH LEVEL USE

In order to assess the level of use we offer the below graph that shows the Australian results for over two thousand Hair drug tests in 2019 divided up into ten percentile groups.

A Patient that returns a Positive Drug Test Result of **Methamphetamine 64 ng/ 10 mg** is in the 70th percentile, that is, an average of 100 Methamphetamine detections in a Psychomedics Hair Drug Test in Australia a level of between 45.5 and 84.6 ng/ 10 mg there would be approximately 70 people with a lower detection level and 30 with a higher detection level.

PERCENTILE	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
EtG ALCOHOL	6.1	8.7	12.7	16.2	21.6	34.6	58.3	89.5	143	> 143
METHAMPHETAMINE	7.21	8.92	12	17.4	21.4	31.7	45.5	84.6	150	> 150
MARIJUANA	2.5	5.5	11.3	18.1	31	44.9	73	94.6	151	> 151
COCAINE	5.77	8.16	10.2	12.9	15	19.5	24.1	50	107	> 107
MDMA	6.93	8.24	12.7	14.6	21.9	22.4	30.2	41	47.6	> 47.6
AMPHETAMINES	5.86	6.98	9	11.4	13.8	18	26.8	35	42.9	> 42.9
OPIATES	2.57	2.79	3.43	4.26	6.24	8.23	10.8	16.7	27.1	> 27.1

Where the outcome of the Drug Test results may impact a persons life, career or family we recommend a suitable experienced Toxicologist provide an interpretation that takes into consideration additional factors including medication, other substances detected, polydrug impacts etc.

We recommend a Toxicologists interpretation report can be provided where required however an additional fee is required for a Scientists report.

General Hair Drug Test Facts

What is hair drug testing?

Hair testing analyses for drugs within the hair shaft, rather than body fluids like urine or saliva, to determine whether drugs of abuse are present. Compared to analysis of body fluids, hair testing is highly resistant to evasion by adulterating or substituting samples, or by simply abstaining from drug use for a few days. Psychemedics' patented method for detecting drugs in hair uses proprietary immunoassay and state-of-the-art GC/MS/MS or LC/MS/MS confirmation to measure the drug molecules and metabolites permanently entrapped in hair which were incorporated following ingestion. This technology offers significantly greater detection ability than other methods of analysing hair or body fluids.

Who is using hair drug testing?

Thousands of corporations use Psychemedics' test to screen applicants and perform random drug tests on their employees. Schools have been using the Psychemedics test since 1997 to help their students stay drug-free. Courts routinely use Psychemedics' test in their probation, parole, and diversionary programs. The use of hair is well established, and Psychemedics has been doing hair tests since 1987.

What drugs are included in a standard hair drug test?

Cocaine, marijuana, opiates (including heroin, codeine, morphine, oxycodone, oxymorphone, hydrocodone and hydromorphone), methamphetamine, Ecstasy (MDMA), Eve (MDEA) and phencyclidine (PCP).

Does a Psychemedics hair test pull hair out of the scalp to examine the follicle?

No. Testing a hair follicle would require a painful collection process. Psychemedics requires the smallest sample in the industry, snipping above the scalp. No hair is "pulled" out of the scalp, and the hair follicle is not disturbed. Sample collection is a completely painless, quick procedure.

What time period does a standard test cover?

A standard test of one-and-one-half inches of head hair cut close to the scalp can provide a several month window to detect drug ingestion.

How fast does head hair grow?

Studies indicate that hair collected at the crown of the head grows on the average approximately 1.3 cm (or ½ inch) per month. This growth rate may vary among people; consequently, the same 3.9cm length of hair may represent slightly different time periods.

How does hair analysis compare to urinalysis?

The primary difference is the wider window of detection with hair. Cocaine, methamphetamine, opiates, and PCP are rapidly excreted and usually undetectable in urine 72 hours after use. Rather than the hours or days covered by a body fluid test, a hair test covers a period of months, ensuring that a drug user cannot evade the test by simply abstaining for a few days. Additional advantages include: non-intrusive collection procedures, virtual elimination of test evasion through substitution or adulteration, and greater accuracy through test repetition capability. The combination of an increased window of detection and resistance to evasion makes hair testing far more effective than urinalysis in correctly identifying drug users.

How soon after drug use can a drug be detected in hair?

It takes approximately 5-7 days from the time of drug use for the portion of the hair containing that drug to grow above the scalp.

What is the shortest time period that can be evaluated?

In most situations, the minimum time period is approximately one month. A hair test does not determine drugs used on a particular day or week.

How sensitive is hair testing in detecting drug users?

Comparison studies have proven that Psychemedics' testing is up to 6-10 times more effective in identifying drug users than urinalysis. In other words, 85% of the drug users identified by a Psychemedics test could get through a urine screen and enter the workforce.

Is all hair testing alike?

No, Psychemedics uses its proprietary digestion method to remove virtually 100% of the drugs from the hair, thereby increasing detection capabilities. Other laboratories may leach drug from the hair, leaving behind or destroying some of the drug in the process. Psychemedics also employs an extensive wash procedure on test samples, and analyses the wash to ensure that any potential contamination has been removed or taken into account. Other labs may use a less effective wash and/or do not analyze the wash, putting their clients at risk for making employment decisions based on a result that may be reflective of external contamination.

How does Psychemedics establish its cut-off levels?

These levels are based on field studies that establish the presence of the drugs following ingestion. These levels are included in Psychemedics' FDA submissions, and are similar to the cut-off levels in the 2004 proposed SAMHSA mandatory guidelines.

How much hair is needed for a hair drug test?

Psychemedics' standard screen, along with GC/MS/MS or LC/MS/MS confirmation, usually requires a cosmetically undetectable lock of hair preferably snipped from the back of the head, just below the crown. In general, the amount needed is the thickness of a shoelace tip. Hair analysis methods used by other laboratories may require significantly more hair.

Can hair drug tests be run on people with little or no hair?

Yes. Hair can be collected from several locations on the head and combined to obtain the required amount of hair. If head hair is not available, certain body hair can be used as an alternative.

Can hair collected from a brush be used?

No. For workplace drug testing, Psychemedics requires a hair sample to be collected using the proper chain-of-custody protocols that will withstand a legal challenge. Psychemedics requires that the sample be submitted with Psychemedics Sample Acquisition Materials. The test subject must initial the sample to certify the authenticity of the sample at the time of collection.

How are collections performed on candidates that use artificial hairpieces or attachments to their own hair?

The collection process allows the collector only to take the candidate's natural hair. Natural head hair or nape hair can be taken. Body hair can also be taken when hair from those two sources is not available.

Where do I get help regarding collection?

Psychemedics provides detailed instruction through a written training manual and video. Both are available in English and Spanish. Additional help is available through Client Service Managers dedicated to each client, and from Psychemedics' professional trainer.

Does chemical treatment of the hair affect the test results?

Commonly used hair procedures (e.g., shampoos, conditioners, sprays, mousses and gels) have no significant effect on results. In fact, normal hair washing helps to remove external contamination. Normal hair treatments such as bleaching, perming and dyeing generally will not significantly lower the quantitative results. If the protein matrix of the hair has been damaged to the point of breaking (cortex damage) the level of drug can be significantly affected. However, severely treated or damaged hair can be readily identified from the wash ratios and/or staining procedure.

Is there a risk that the results of a hair test can be affected by environmental contamination?

Psychemedics utilizes several independent approaches which, in various combinations, rule out the possibility of a positive result from external contamination. The first method involves extensive chemical washing of the hair specimen prior to screening, followed by analysis of the content of the wash. This wash analysis is a critical step to ensure that any contamination is effectively accounted for. Additionally, Psychemedics measures the presence of metabolites. If drugs were in the air or on a person's hands and thereby got on a person's hair from outside, the drug would be present as the drug substance itself, and not as certain metabolites or with metabolite/parent drug ratios which are known to be produced by ingestion. Psychemedics' ability to distinguish and measure metabolites with its highly sensitive GC/MS/MS or LC/MS/MS equipment is one criteria used to eliminate the possibility of false positives from external contamination. In addition, any positive internal contamination (e.g., from passive inhalation or even poppy seed consumption) is distinguished from deliberate drug use by setting GC/MS/MS or LC/MS/MS cut-off levels above those which can be produced by passive internal exposure. Studies have shown that the combination of extensive washing, metabolite analysis, and proper cut-off levels are necessary to avoid false positives due to external contamination.

Does Psychemedics perform GC/MS/MS or LC/MS/MS confirmation of all positive results?

Psychemedics provides automatic confirmation for samples which screen positive.

What is done with the excess hair that is not tested?

The hair not used from the time period being tested and all remaining hair is stored in the chain-of-custody sample acquisition pouch. Negative hair is stored for approximately 1 month. Positive hair is stored for two years.

How long are positive test result reports kept on file?

Laboratory records and test results are kept for a five-year period.

Has Psychomedics' drug testing been admitted in court?

Yes. The use of Psychomedics' hair testing for drugs of abuse has been routinely admitted in both state and federal courts, as well as arbitrations and agency hearings. The test results are routinely upheld. Some court systems use hair analysis as part of their probation, parole, and diversionary programs.

Is hair testing included in SAMHSA/NIDA guidelines?

Under SAMHSA/NIDA's current guidelines for federally-mandated testing, urine is the only specimen included for testing certain government employees and that segment of private sector testing that falls under the Department of Transportation or other agency guidelines. In a November 2008 press release, SAMHSA states that HHS will continue to pursue substance abuse testing using alternative matrices, including hair specimens, and anticipates issuing further revisions to the Mandatory Guidelines addressing the use of hair specimens.

1 External Exposure Triggers Positive Results.

No. Scientists from the Federal Bureau of Investigation (FBI) extensively researched Psychomedics and published their findings in peer-reviewed journals. Their conclusion? The Psychomedics extensive washing process eliminates external contamination as a factor in test results. A positive result indicates "ingestion" or "systemic" presence rather than "exposure" to a drug.

2 Hair Color Or Type Effects Results.

Wrong. A number of independent studies over the years have concluded neither hair color nor hair type effects the results of a hair test for drugs of abuse. In fact, a comprehensive study presented in *Criminal Justice Review* concluded that "no evidence that one group (i.e., race) was more adversely affected by hair testing compared to urine testing."

3 A Psychomedics Test Is A Follicle Test.

Incorrect. While sometimes referred to as follicle testing, the Psychomedics drug test using hair analysis does not affect the hair follicle. The sample to be tested is snipped with scissors above the scalp line. In the event head hair is too short to collect a one-half inch sample the diameter of a pencil lead, body hair is collected. The follicle is **never** removed or disturbed.

MEASURING ALCOHOL IN HAIR

Psychomedics uses a triple quad mass spectrometry test to determine the level of ethyl glucuronide (EtG) present in hair. EtG is measured in pg/mg and we follow the guidelines determined by the World Health Organization in association with the Society of Hair Testing.

LEVEL	RESULT
0-1.9 pg/mg	Negative
2.0 pg/mg	Mild to Moderate Consumption
30+ pg/mg	Excessive Alcohol Consumption

The test will identify those consuming as few as 2-3 alcoholic drinks (on average) per week, resulting in a level reported in the "Mild to Moderate Consumption" category. To be considered in the category of "excessive alcohol consumption" and fall into the category of 30 pg/mg or greater, an average of at least 4-6 alcoholic drinks per day would have to be consumed over an average of 3 months.