



HAIR TESTING QUESTIONS AND ANSWERS

DRUGS/CUTOFFS **TECHNICAL**

1) What methodology is used?

- A two-tiered testing process is used:
 - A portion of the Hair sample is first screened using Enzyme Linked Immunosorbent Assay (ELISA), a proven reliable methodology for routine drug testing.
 - Any samples that are presumptively positive in the screening process are then confirmed, utilizing another portion of the hair sample, using either gas chromatography/mass spectrometry (GC/MS) or gas chromatography/mass spectrometry/mass spectrometry (GC/MS/MS).

2) What is ELISA?

- ELISA is an acronym for enzyme-linked immunosorbent assay. ELISA assays are heterogeneous non-isotopic assays that usually have an antibody immobilized onto a solid support. The ELISA assay uses a microtiter plate that has the antibody to the drug, drug metabolite or drug class coated to each well of the microtiter plate.

3) What is the difference between EIA and ELISA?

- EIA is the more traditional enzyme immunoassay. The technology has been widely used for the analysis of drugs of abuse. It is homogenous in nature meaning that the analysis is performed without any physical separation during the analysis. ELISA is heterogeneous — the microtiter plate is washed before the reaction is allowed to go to completion. In general, ELISA assays may offer greater sensitivity than most EIA procedures.

4) Is ELISA forensically defensible?

- Yes, the technology is well established and has been used in many formats for the analysis of drugs of abuse, therapeutic drug monitoring (TDM) and serology (antibody tests) and blood banking procedures. Furthermore, ELISA technology is used extensively in the pharmaceutical industry for new drug screening and development.

5) What is the difference between GC/MS and GC/MS/MS?

- GC/MS is the more traditional confirmation method for drugs of abuse testing. Both technologies produce a “molecular fingerprint” of the drug or compound being analyzed and provide definitive identification. GC/MS/MS, a newer technology also known as “tandem MS”, generally provides greater sensitivity which is often required for the analysis of alternative specimens.

6) What is the turnaround time?

- The laboratory receives the samples via overnight courier and US Mail. Preparation of the sample for testing is performed the day the samples arrive and the initial test is completed overnight. Negative results are reported within 24 hours of receipt. Positive results are confirmed, reviewed, and reported within 48-72 hours of receipt.

7) What drugs are tested with Hair testing?

- The drugs tested are the following: Amphetamines (Amphetamine, Methamphetamine, MDMA and MDA), Opiates (Codeine, Morphine and 6- monoacetylmorphine), Cocaine (and cocaine metabolites), Marijuana metabolite (THC Carboxylic Acid metabolite), and PCP.

8) Can Hair testing detect Ecstasy?

- Yes, Ecstasy is reported under the "Amphetamines" group.

9) Can Hair testing detect oxycodone or other synthetic opiates?

- No, currently our Hair testing procedures do not target oxycodone or other synthetic opiates.

10) How long are positive (non-negative) specimens retained by the laboratory?

- Non-Negative specimens are retained for a minimum of 12 months (the same as non-negative urine specimens).

11) Will the test results really reflect 90 days use of drugs?

- Hair follicles underneath the scalp are surrounded by a dense network of capillary blood vessels. Drugs in the bloodstream are able to incorporate and bind to the hair follicles underneath the scalp. It takes approximately 3-10 days for hair containing drug to reach the outer environment on top of the scalp to be collected based on the average rate of head hair growth. Head hair grows approximately 1.3 cm or ~1/2-inch per month. The standard length of hair tested by the laboratory is the first 3.9 cm or ~1 1/2 inches from the root end. Therefore, a hair analysis of 3.9 cm covers a time span of approximately 90 days and detects a pattern of drug use over this time-frame. Many employers find it

useful to test both hair and urine for pre-employment purposes. Urine is useful for detecting recent or new drug use (last 1-3 days except Marijuana which is longer) and hair for providing an approximate three-month drug history.

12) Is Hair analysis appropriate for workplace drug testing other than pre-employment?

- Because Hair testing detects drug use over a long period of time, usually around 90 days, it is not an appropriate method for post-accident or reasonable suspicion testing. In both of these situations, the drug testing procedure should detect the drug use of an individual as close as possible to the time of the incident. However, hair tests are appropriate for random testing protocols – especially if hair was used for the pre-employment test or the employee has been working for more than 90 days.

REPORTING

13) How are the results reported?

- As with all laboratory-based testing, results are logged in the laboratory information system and reported to the client by confidential fax, direct interface, printer, or voice response.

ADULTERATION

14) Can Hair testing be beaten?

- We have not found any adulterants that can beat the test at this time. Moreover, the risk is minimized because every collection is directly and easily observed.

COLLECTION/SUPPLIES

15) Can I use my urine Custody and Control Form?

- There is an alternative specimen Custody and Control Form that should be used. It is intended for lab based testing of both hair and oral fluid specimens.

16) Can the test be run if I use the regular Custody and Control Form by mistake or I have run out of the alternate Custody and Control Form?

- Yes, but the tamper-evident tape on the urine Custody and Control Form is designed for the urine bottle and is too long for the hair envelope.

17) How do I order the Hair Collection Kits?

- You can order the Hair Collection Kits from Quest Diagnostics. You can order these supplies by the same procedure as you would order the routine Custody and Control Forms and the urine collection kits. Either call 1-800-877-7484 or you may use our e-mail (poc.t.es@questdiagnostics.com) or fax line.

18) What do I receive when I order Hair Collection Kits?

- A specimen transportation bag, Hair Specimen Collection Envelope, alcohol pad and aluminum foil for each kit ordered.
- Airbills for shipping the specimens to either the Las Vegas or Atlanta laboratory.
- Custody and Control Forms must be ordered separately.

19) How are the hair samples collected?

- In order to be fair to the donor, we must have enough hair to repeat assays if necessary. The test requirements are 100 mg of hair per inch and a half by weight. Hair weight varies among individuals. Since collectors do not have access to sensitive scales, it is easier to visualize in numbers of hairs or sample size.

If the hair is over 4 inches long, then we require approximately 120 strands. If placed in a bundle this quantity of hair would resemble the circumference of a pencil. It is critical that the root ends of the cut hair are aligned and placed with the root ends extending about 1/4-inch beyond the pointed portion of the arrow formed by the foil in the collection kit. In order to approximate time of use (prior 90 days), the laboratory will cut and use about 1 ½ -inches from the root end.

If the hair is shorter than 4 inches, but longer than 1/12 inch, more hair is required. If the hair is curly, root ends do not have to be kept aligned and the sample size should resemble the size of a standard cotton ball.

If the donor has no head hair or hair shorter than 1/2-inch long, the collector may use chest, underarm, leg, or face hair — in that order of preference. Please note the source of the sample on the hair collection envelope. This will aid in a more accurate interpretation of the results. If body hair is collected, make sure to collect as much hair as possible. This hair is usually lighter in weight and therefore more hair is needed for testing. This specimen type will be reported with a disclaimer indicating that interpretation of results may not be consistent with expected results from head hair.

20) What acceptance/rejection criteria does the laboratory use for proceeding with the analysis of a hair specimen?

- The following would be reasons for rejecting a hair specimen:
 - a. No Chain of Custody.
 - b. No way to link specimen with the donor.
 - c. Quantity of hair insufficient for analysis.
 - d. Length of hair less than one centimeter (1 cm).

TRANSPORTATION

21) How do I get the specimen to the laboratory?

The specimen should be sent via overnight courier to our Las Vegas or Atlanta laboratories.

REGULATIONS

22) Can Hair testing be used for Department of Transportation (DOT) testing?

- No, the Department of Transportation (DOT) has not approved Hair testing at this time.