



## FREQUENTLY ASKED QUESTIONS Quest Diagnostics Hair Testing

### DRUGS & CUTOFFS – TECHNICAL EXPLANATIONS

**Q: Why drug test?**

A: Drug abuse in the workplace puts employers at a risk of higher insurance costs, increased accidents, more absenteeism and lower productivity. Hair testing, like all drug testing methodologies, helps to mitigate these risks by screening out applicants and employees who use drugs. To calculate what your company could save with a drug testing program; use our [Drug Testing ROI Calculator](#).

**Q: Why hair testing?**

A: Hair testing for drugs of abuse is the only drug testing method available that provides up to a 90-day drug use history. When compared with urine testing, hair testing tends to provide a greater number of positives due to its longer detection window. This makes hair testing from Quest Diagnostics an ideal solution for a number of drug testing scenarios and programs.

**Q: What sets Quest Diagnostics hair testing apart?**

A: The accuracy and reliability of the results that we provide is paramount. But hair testing with Quest Diagnostics extends beyond just the results that we provide. We pride ourselves in working closely with our clients to develop a comprehensive drug screening program supported by our knowledgeable customer service representatives. Our goal is to answer your questions, to ensure your program runs smoothly, and to show that we're there when you need us.

**Q: What testing situations are best suited to a hair test?**

A: Unlike urine drug testing, which may only detect drug use within the past two to three days, hair testing is able to detect a pattern of repetitive drug use for up to 90 days. While urine testing is well suited to detect recent drug use, a hair test is the most effective way to evaluate long-term patterns of repetitive drug use, making it an excellent option for pre-employment or random testing programs.

**Q: Is hair analysis appropriate for workplace drug testing other than pre-employment?**

A: Because hair testing detects drug use over a pattern of use over a long period, usually up to 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 as closely as possible to the time of the incident – e.g. with urine or oral fluid testing. 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.

**Q: What is the standard result turnaround time?**

A: Our dependable turnaround times drive timely hiring decisions. Hair specimens are sent by overnight delivery and are typically tested on the day they arrive at our laboratory. Negative results are often released within 24 hours. Non-negative screens undergo confirmatory testing and are typically released within an additional 24 to 72 hours.

**Q: What testing methodology is used for hair tests?**

A: A two-tiered testing process is used:

- 1) A portion of the hair specimen is screened using an Enzyme Linked Immunosorbent Assay (ELISA) - a reliable and proven methodology for routine drug testing.
- 2) Any specimens that are presumptively positive in the screening process are then confirmed, utilizing another portion of the hair specimen, with either gas chromatography/mass spectrometry (GC/MS) or gas chromatography/mass spectrometry/mass spectrometry (GC/MS/MS).

**Q: What is ELISA?**

A: 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.

**Q: Is ELISA forensically defensible?**

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

**Q: What is the difference between EIA and ELISA?**

A: 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.

**Q: What is the difference between GC/MS and GC/MS/MS?**

A: 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 is a newer technology that is also known as “tandem MS” and generally provides greater sensitivity which may be necessary for the analysis of alternative specimens, such as hair or oral fluid.

**Q: What is “tandem” MS?**

A: Tandem mass spectrometry (MS/MS) is an analytical technique that combines two mass spectrometers into one instrument, which provides greater sensitivity. As a compound is introduced into the MS/MS, usually by a chromatographic method such as gas chromatography (GC) or liquid chromatography (LC), the first MS ionizes the compound into a few, very specific pieces. These pieces or molecular fragments are characteristic of individual compounds. They are called precursor (or parent) ions. The precursor ions produced by the first MS can be filtered so that only specific fragments are allowed entry into the second MS. The second MS takes the precursor ions and fragments (ionizes, breaks) them into smaller, highly specific pieces called product ions. The product ions are used as the “molecular fingerprint” to identify the compound of interest.

**Q: Does Quest Diagnostics perform GC/MS/MS or LC/MS/MS confirmation of all positive results?**

A: Yes. Quest Diagnostics provides automatic confirmation for specimens which screen positive.

**Q: What certifications do Quest Diagnostics laboratories maintain?**

A: Our laboratory certifications and accreditations lead the industry and include SAMHSA (urine), CAP-FDT (hair, oral fluid, and urine), Florida (hair and urine), and New York State (hair, oral fluid and urine). Furthermore, our hair testing procedures have been published in peer-reviewed journals and presented at scientific meetings. The bottom line is, when you partner with Quest Diagnostics you’re partnering with a leader in hair testing.

**Q: Can I see the hair testing laboratory in process?**

A: While there is no better way to learn about our testing processes than to take a live laboratory tour, this video is the next best thing as it details the processes and procedures involved in testing hair for drugs of abuse. Navigate to [HairTesting.com](http://HairTesting.com) to watch our online laboratory tour.

**Q: What drugs are tested with hair testing?**

A: Quest Diagnostics uses hair specimens to test for the following drugs:

- Amphetamines (Amphetamine, Methamphetamine, MDMA and MDA). Ecstasy is reported under the "Amphetamines" group.
- Opiates (Codeine, Morphine and 6-monoacetylmorphine) or "expanded" opiates (which includes semi-synthetic opiates)
- Cocaine (and cocaine metabolites)
- Marijuana metabolite (THC Carboxylic Acid metabolite)
- PCP (Phencyclidine)

**Q: Can hair testing detect oxycodone or other semi-synthetic opiates?**

A: Yes. Upon request, a customer's testing panel may also include confirmatory testing for semi-synthetic opiates (hydrocodone, hydromorphone, oxycodone, and oxymorphone).

**Q: How long does the Laboratory retain positive (non-negative) specimens?**

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

**Q: What are the cutoffs and analytes for the standard 5-panel hair test?**

DRUG CLASS	INITIAL TEST LEVEL	CONFIRMATORY LEVEL	CONFIRMATORY METHOD
<b>AMPHETAMINES</b>	<b>300 pg/mg</b>		
Amphetamine		300 pg/mg	GC/MS
Methamphetamine		300 pg/mg	GC/MS
MDA (Methylenedioxyamphetamine)		300 pg/mg	GC/MS
MDMA (Methylenedioxymethamphetamine)		300 pg/mg	GC/MS
<b>COCAINE / METABOLITES</b>	<b>300 pg/mg</b>		
Benzoylcegonine		300 pg/mg	GC/MS
Cocaine		300 pg/mg	GC/MS
Cocaethylene		300 pg/mg	GC/MS
Norcocaine		300 pg/mg	GC/MS
<b>MARIJUANA</b>	<b>1.0 pg/mg</b>		
THCA Metabolite		0.1 pg/mg	GC/MS/MS
<b>PHENCYCLIDINE</b>	<b>300 pg/mg</b>	300 pg/mg	GC/MS
<b>OPIATES*</b>	<b>500 pg/mg</b>		
Morphine		500 pg/mg	GC/MS
Codeine		500 pg/mg	GC/MS
6-Acetylmorphine (6-AM)		500 pg/mg	GC/MS
<b>EXPANDED OPIATES*</b>	<b>500 pg/mg</b>		
Morphine		500 pg/mg	GC/MS
Codeine		500 pg/mg	GC/MS
6-Acetylmorphine (6-AM)		500 pg/mg	GC/MS
Hydromorphone		500 pg/mg	GC/MS
Hydrocodone		500 pg/mg	GC/MS
Oxycodone		500 pg/mg	GC/MS
Oxymorphone		500 pg/mg	GC/MS

\*Panel can include either opiates or expanded opiates. Expanded opiates will incur an additional fee.

**Q: Will the test results really reflect drug use over the past 90 days?**

A: Yes. 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 5 to 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 a ½ inch per month. The standard length of hair tested by the laboratory is the first 3.9 cm or 1½ 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 timeframe. Many employers find it useful to test both hair and urine (or oral fluid) for pre-employment purposes. Urine (or oral fluid) is useful for detecting recent or new drug use (the last one to three days) and hair for providing an approximate three-month drug history of repetitive use.

**Q: What is the window of detection if hair from an alternate body location (e.g. chest, arm, etc.) is used?**

A: The growth rate and rates of incorporation of drugs into hair from locations other than the head has not been studied as extensively as that of head hair. Moreover, unlike head hair which continues to grow, body hair tends to grow to a certain length and then stop growing. Consequently, one cannot reliably determine the window of detection of drugs using hair from alternative body sites.

**Q: What is the positivity rate for workplace drug tests using hair?**

Drug Category	2007	2008	2009	2010	2011
Overall	9.5%	7.8%	7.0%	7.2%	7.7%
Amphetamines (Methamphetamine)	1.2%	0.86%	1.2%	0.87%	0.91%
Cocaine	5.3%	4.2%	3.3%	2.3%	2.5%
Marijuana	3.9%	3.4%	3.0%	4.5%	4.8%
Opiates	0.17%	0.14%	0.15%	0.08%	0.15%
PCP	0.01%	0.00%	0.01%	0.01%	0.01%

**Q: How do I know whether or not my hair test included expanded opiates?**

A: All Quest Diagnostics reports include the name of the test(s) being ordered. In the case of hair tests that include expanded opiates, the order code listed in the “Tests Ordered” section of the laboratory report will include the following verbiage: “(EXPANDED OP)” or “EXPOSURE EXOP” – e.g. “Hair-5 (EXPANDED OP).”

**Q: Is it appropriate to analyze segments of hair to identify specific time periods of drug use?**

A: No. While head hair grows at approximately ½ inch per month, the rate of growth is not constant between or within individuals. Consequently, we are of the opinion that segmental analysis should not be used to identify specific intervals of drug use in a forensically defensible manner.

**Q: Does Quest Diagnostics use “wash” procedures in hair analysis?**

A: Yes. All hair specimens are washed prior to screening and confirmation analysis to remove external contamination. Please note that the “wash” procedures were reviewed by the FDA as a part of the 510(k) clearance.

**Q: How do we know that Quest Diagnostics hair testing procedures are accurate and reliable?**

A: Quest Diagnostics hair testing assays for amphetamines, cocaine, marijuana, opiates, and PCP are all FDA-cleared. Also, our procedures have been presented in peer-reviewed journals and presented at scientific meetings

## **REPORTING**

**Q: How are the results reported?**

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

**Q: What is the turnaround time?**

A: The laboratory receives the specimens via overnight courier or U.S. Mail. Preparation of the specimen for testing is performed the day the specimens arrive and the initial test is completed overnight. Negative screening results are typically reported within 24 hours of specimen receipt. Positive results are confirmed, reviewed and typically reported within an additional 24 to 72 hours.

**Q: What is done with the excess hair that is not tested?**

A: Hair not used from the time period being tested (i.e. longer than 3.9 cm) and all remaining hair is stored in the chain of custody specimen acquisition pouch. Negative hair is stored for approximately one (1) week. Positive hair is stored for two (2) years.

**Q: How long are positive test result reports maintained on file?**

A: Laboratory records and test results are maintained for a minimum two-year period.

## **ADULTERATION**

**Q Can a hair test be beaten/adulterated?**

A 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.

**Q Some competitors are saying that the Quest Diagnostics hair testing procedures are susceptible to hair treatments while theirs are not?**

A In the Quest Diagnostics studies, specimens were tested under worst-case conditions on hair that had been previously cut into smaller pieces and tested by the laboratory (it is not practical to perform controlled studies using intact human hair on the heads of drug users). Even using these extreme conditions, most of the treatments had minimal or no impact for all drugs except for opiates and, to a certain extent, PCP.

## **COLLECTIONS**

**Q: How is a hair specimen collected?**

A: In order to be fair to the donor, we must have enough hair to repeat assays if necessary. Consequently, the requested amount of hair is approximately 100 mg made up of the first 1 ½ inches (from the root end) of the hair specimen. Since hair weight varies by individual and since collectors do not have access to sensitive scales, it is easier to visualize in terms of the number of hairs in the specimen size.

If the hair is more than 4 inches long, we require approximately 120 strands. If placed in a bundle this quantity of hair would resemble the circumference of a pencil; or if laid flat, would be approximately 1 cm in width. It is critical that the root ends of the cut hair are aligned and placed with the root ends extending about ¼ 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 four inches, but longer than a ½ inch, more hair is required. If the hair is curly, root ends do not have to be kept aligned and the specimen size should resemble the size of a standard cotton ball.

If the donor has no head hair or hair shorter than ½ inch long, the collector may use chest, underarm, leg, or facial hair — in that order of preference. Please note the source of the specimen 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 as possible. This hair is usually lighter in weight and therefore more is needed for testing.

**Q: How much hair is needed to perform the drug test?**

A: Quest Diagnostics standard screen 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 equates to a single row of hairs approximately one centimeter wide.

**Q: Can tests be run on people with little or no hair?**

A: 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.

**Q: Can hair collected from a brush be used?**

A: No. For workplace testing, Quest Diagnostics requires a hair specimen to be collected directly from the donor's head or body using the proper chain of custody protocols that will withstand a legal challenge.

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

A: 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.

**Q: Some competitors are saying that I cannot use Quest Diagnostics if I need to test hair from an alternative body site. Is this true?**

A: No. Quest Diagnostics will test hair from alternative body sites and the laboratory report clearly indicates the hair source (e.g. head, underarm, chest, etc.) While the current Quest Diagnostics hair testing FDA-filings do not include data from alternative body sites, the competitive FDA-cleared system only reported data from alternative body sites in three of its five assays. The "Precaution and Warnings" section of the competitive FDA-cleared system reported that two of the assays were designed/evaluated using head hair specimens and two other assays were evaluated using "primarily" head hair. Of the three assays that included data from alternative body sites, two included positive data from five and four participants, respectively and the third assay included positive specimens from 12 subjects.

**Q: Does chemical treatment of the hair affect the test results?**

A: 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.

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

A: Quest Diagnostics utilizes several independent approaches, in various combinations, to rule out the possibility of a positive result from external contamination. The first approach involves washing of the hair using several different wash procedures designed for the specific screening or confirmatory test being performed. The second approach, for some confirmatory assays, involves the measurement of drug in the "wash solution" to correct for potential external contamination of the hair. The third approach, for some drugs, involves the identification of drug metabolite(s). Studies have shown that the combination of extensive washing, wash analysis, and metabolite analysis are necessary to avoid false positives due to external contamination.

**Q: What acceptance/rejection criteria does the laboratory use for proceeding with the analysis of a hair specimen?**

A: The following would be reasons for rejecting a hair specimen:

- No Chain of Custody Form
- No way to link specimen with the donor
- Quantity of hair insufficient for analysis
- Length of hair less than 1 cm
- Hair contaminated with lice

**Q: How many hair collection sites are available to perform Quest Diagnostics hair collections?**

A: Our network of hair collection sites contains more than 1,200 locations across the country, with additional locations around the globe. Our collection sites deliver a convenient, consistent and professional experience that reduces employee downtime and improves donor satisfaction. We make available our online training and specimen collection certification for collection sites in our network. These locations also maintain a supply of hair collection supplies on-site, meaning your donors simply need to show up and provide their hair specimen.

**Q: How do I get the specimen to the laboratory?**

A: Use one of the provided air bills to ship the specimen via overnight courier to our Lenexa, KS laboratory.

## **REGULATIONS**

**Q: Can hair testing be used for Department of Transportation (DOT) testing?**

A: No, the Department of Transportation (DOT) has not approved hair testing at this time.

**Q: Is the Quest Diagnostics hair test FDA-cleared?**

A: Yes, the Quest Diagnostics screening tests for amphetamines, cocaine, marijuana (THC), opiates and PCP are all FDA-cleared.

**Q: What does FDA-clearance mean?**

A: The FDA has evaluated both performance data and labeling. An FDA-cleared assay meets current standards for accuracy and reliability, including the importance of confirmatory testing when the results of the screening test are positive. Manufacturers of tests with FDA approval or clearance have provided the FDA with data to assure that their tests generate reliable results for the specimens being tested. The evaluation of accuracy and reliability includes documentation that confirmed positives are not a result of external contamination.

**Q: Some competitors are saying that the Quest Diagnostics hair testing procedures are not effective in releasing drug from hair. Is this true?**

A: No. As a part of the FDA-clearance process, Quest Diagnostics has shown that its hair testing protocols generate reliable results and are effective at detecting drug in hair.

**Q: Some competitors say that Quest Diagnostics' own FDA filing shows that its procedures may not be effective in releasing drug from hair. Why is that?**

A: Let us again restate that as a part of the FDA-clearance process, Quest Diagnostics demonstrated that its hair testing protocols generate reliable results and are effective at detecting drugs in hair. The protocols used to determine the "recovery" data reported in the publicly available FDA summaries for the two different FDA cleared testing systems, were very different. The Quest Diagnostics studies were designed to test the recovery of drugs from the hair of positive specimens - i.e. comparison of screening extraction procedures versus a longer process designed to recover all drugs in the hair matrix. The competitor's studies were designed to assess the stability or 'recovery' of the drug during their digestion process - i.e. spiked pre- and post-digestion – not the recovery of drug from hair. Additional studies performed by Quest Diagnostics have demonstrated that when drugs are spiked onto hair, as competitors have done, our recovery is greater than 95%.

**Q: Have Quest Diagnostics hair testing procedures withstood legal and/or administrative challenges?**

A: Yes. Quest Diagnostics hair testing procedures and results have successfully withstood legal challenges in workplace testing, military proceedings and other civil jurisdictions.

**Q: Has Quest Diagnostics testing been admitted in court?**

A: Yes. The use of 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.

**Q: Does Quest Diagnostics provide legal support for hair testing results?**

A: We have been performing hair testing for drugs of abuse for more than 15 years. From the beginning we've stood behind every result reported by our laboratory. Our results have successfully withstood legal challenges in workplace testing, military proceedings and other civil jurisdictions. Our proven legal track record of success supports the fact that we provide reliable, accurate hair testing results that you can depend on.

**Q: Is hair testing included in SAMHSA/"NIDA" guidelines?**

A: Under SAMHSA/NIDA's current guidelines for federally-mandated testing, urine is the only specimen permitted for testing 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.

**Q: Are Quest Diagnostics tests cleared by the Food and Drug Administration (FDA)?**

A: The FDA sets minimum standards for drug tests used in a workplace setting, requiring that they be performed with screening tests that have been approved, cleared, or otherwise recognized by the Food and Drug Administration as "accurate and reliable." Quest Diagnostics screening tests for amphetamines, cocaine, marijuana (THC), opiates and PCP have all been evaluated and cleared by the FDA.

## **SUPPLIES**

**Q: Can I use my urine Custody and Control Form?**

A: No. There is an alternative specimen Custody and Control Form that should be used which is intended for the lab-based testing of both hair and oral fluid specimens.

**Q: Can the test be run if I use the regular Custody and Control Form by mistake or if I run out of the alternate Custody and Control Form?**

A: Yes, however 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.

**Q: How do I order the Hair Collection Kits?**

A: While hair collection kits and supplies are provided at our collection sites, you may order the Hair Collection Kits from Quest Diagnostics. Order these supplies using the same procedure you use to order routine Custody and Control Forms and the urine collection kits. Call 1-800-877-7484 or e-mail us at [es.orders@questdiagnostics.com](mailto:es.orders@questdiagnostics.com).

**Q: What do I receive when I order Hair Collection Kits?**

A: Each Hair Collection Kit contains a specimen transportation bag, a Hair Specimen Collection Envelope, an alcohol pad and aluminum foil. Additionally, you will receive air bills for shipping the specimens to the Lenexa, KS, laboratory. *Please note that Custody and Control Forms must be ordered separately.*