

# GUIDELINES FOR LABORATORY-BASED ORAL FLUID WORKPLACE DRUG TESTING

## Section 1 – Applicability

### *Section 1 Recommendations*

**Recommendation 1** – These guidelines apply only to laboratory-based oral fluid tests.

**Recommendation 2** – These guidelines apply only to private sector workplace testing.

**Recommendation 3** – Private sector oral fluid testing may be limited or restricted by state statute, regulation, or local ordinance.

**Recommendation 4** – Before beginning workplace oral fluid drug testing, a legal review should be conducted of all policies and consents.

**Recommendation 5** – These guidelines **do not apply** to Federally Regulated Programs.

## Section 2 – Oral Fluid Specimen

### *Section 2 Recommendations*

**Recommendation 6** – Oral fluid may be used in workplace testing in the following circumstances including but not limited to:

1. Pre-employment
2. Random
3. Reasonable suspicion
4. Post accident
5. Other workplace applications (e.g. fitness for duty, return to duty)

## Section 3 – What are the minimum requirements for Oral Fluid Collection Devices?

Collection of oral fluid is an integral component of the drug testing process and performance characteristics of the collection materials must be clearly established. Collection methods that utilize a device are inherently dependent upon device characteristics and device performance. The performance and characteristics of collection devices can ultimately influence test outcome. At a minimum, oral fluid collection devices must be cleared by the FDA, and procedures for collection should be conducted in accordance with the method described in the manufacturer's package insert. Adherence to manufacturers' procedures will provide the end user assurance of device performance as specified by the manufacturer and evaluated and cleared by the FDA. Drug concentration in oral fluid is known to be influenced by numerous factors such as salivary pH, degree of stimulation of saliva flow, and device characteristics. Adequate recovery of drug/metabolite from the device should be defined by the manufacturer and made readily available to users. If the collection procedure involves use of a buffer or if a neat specimen is collected, the stability of drug/metabolite along with storage conditions must be specified by the manufacturer. Collection devices should indicate when an adequate volume of specimen has been collected.

### *Section 3 Recommendations*

**Recommendation 7** – A collection device cleared by the FDA for the collection of oral fluid, to be tested for drugs of abuse, must be used.

**Recommendation 8** – The device must be used according to the manufacturer's package insert.

**Recommendation 9** – Device manufacturers must provide performance data regarding specimen volume required, recovery, stability of drugs- in-solution, and storage conditions.

<b>Recommendation 10</b> – The device must indicate that adequate volume has been collected.
<b>Section 4 – Collector Qualifications</b>
Oral fluid collectors must successfully complete a training program that at a minimum includes:
<i>Section 4 Recommendations</i>
<b>Recommendation 11</b> – Reading and fully understanding these Oral Fluid Guidelines.
<b>Recommendation 12</b> – Training in the device manufacturer’s required procedures.
<b>Recommendation 13</b> – Demonstrating proficiency through a minimum of 3 mock collections, including completion of chain of custody paperwork.
<b>Recommendation 14</b> – Training in how to handle problems with specimen collection in accordance with best industry practices.
<b>Recommendation 15</b> – Documentation of training is required and must be maintained by the collector.
<b>Section 5 – Collection Site Requirements</b>
An oral fluid sample may be collected at any place where:
<i>Section 5 Recommendations</i>
<b>Recommendation 16</b> – Access to authorized personnel can be maintained.
<b>Recommendation 17</b> – A suitably clean surface for specimen collection and completion of paperwork is available.
<b>Recommendation 18</b> – Sufficient privacy for the donor to protect confidential information.
<b>Recommendation 19</b> – The donor can be observed for 10 minutes prior to the collection.
<b>Section 6 – Collection Procedures</b>
<i>Section 6 Recommendations</i>
<b>Recommendation 20</b> – Collector obtains photo identification, or contacts supervisor for positive identification.
<b>Recommendation 21</b> – Collector requires donor to clear any foreign material from the mouth [e.g. food, gum, tobacco products, lozenges etc.].
<b>Recommendation 22</b> – Collector observes donor for a minimum of 10 minutes prior to providing specimen. Donor may not eat, drink, smoke or put anything in their mouth during the observed waiting period.
<b>Recommendation 23</b> – In presence of the collector, donor opens sealed device and specimen is collected according the manufacturer’s specification. Both collector and donor should also check the expiration date of device.
<b>Recommendation 24</b> – Collected specimen should be kept in view of the donor and the collector at all times prior to it being sealed and labeled for shipment to laboratory.
<b>Recommendation 25</b> – If a “split-specimen” is desired or required by law/regulation/local ordinance it is recommended that rather than splitting the initial specimen a second collection device be used to collect a <u>second</u> specimen. The second specimen can be collected simultaneously or sequentially using an approved device from the same manufacturer. In such cases vials can be labeled “A” and “B”.
<b>Recommendation 26</b> – In the presence of the donor, the collector places tamper evident label/seal across each tube, records date, and has donor initial the seals on specimen tube(s).
<b>Recommendation 27</b> – Appropriate chain of custody form (CCF) should be completed by collector [see Appendix for a model CCF].

**Recommendation 28** – Collector asks donor to read and sign statement on CCF certifying that the specimen identified as having been collected from him/her, and to complete donor contact information.

**Recommendation 29** – Collector must sign CCF.

**Recommendation 30** – After all of the above listed steps have taken place, specimen remains in the collector’s custody or in secure temporary storage until shipped to the laboratory.

**Recommendation 31** – Collector sends copy of CCF and vial(s) in tamper proof mailing pack provided by manufacturer.

**Recommendation 32** – Collector should handle specimens in accordance with “Universal Precautions” as outlined by the U.S Centers for Disease Control and Prevention

## **Section 7 – MRO Review**

### *Section 7 Recommendations*

**Recommendation 33** – All confirmed positive results reported by the laboratory must be reviewed by a Medical Review Officer [MRO].

**Recommendation 34** – An MRO must be a licensed MD/DO with documented training in substance abuse medical review to the standard of practice.

**Recommendation 35** – The MRO review must follow standard accepted practice in workplace drug testing.

**Recommendation 36** – When a laboratory reports a rejected-for-testing result, MRO will report a test-cancelled result to the employer and advise the employer to collect another specimen.

## **Section 8 – Laboratory – General Requirements**

General forensic requirements (e.g. personnel, security etc) are essential for testing of oral fluid specimens for drugs of abuse. The same requirements, as utilized in federally-regulated urine testing, are required for testing oral fluid specimens.

### *Section 8 Recommendations*

**Recommendation 37** – Laboratory Personnel conducting oral fluid testing must have qualifications and responsibilities consistent with Sec 2.3 of the Mandatory Guidelines for Workplace Testing [effective 11/04/2004], herein referred to as The Guidelines, which state:

***Day to Day Management***

(1) The laboratory shall have a responsible person (RP) to assume professional, organizational, educational, and administrative responsibility for the laboratory's drug testing facility.

(2) This individual shall have documented scientific qualifications in analytical forensic toxicology. Minimum qualifications are:

(i) Certification as a laboratory director by the State in forensic or clinical laboratory toxicology; or

(ii) A Ph.D. in one of the natural sciences with an adequate undergraduate and graduate education in biology, chemistry, and pharmacology or toxicology; or

(iii) Training and experience comparable to a Ph.D. in one of the natural sciences, such as a medical or scientific degree with additional training and laboratory/research experience in biology, chemistry, and pharmacology or toxicology; and

(iv) In addition to (i), (ii), and (iii) above, minimum qualifications also require:

(A) Appropriate experience in analytical forensic toxicology including experience with the analysis of biological material for drugs of abuse, and

(B) Appropriate training and/or experience in forensic applications of analytical toxicology, e.g., publications, court testimony, research concerning analytical toxicology of drugs of abuse, or other factors which qualify the individual as an expert witness in forensic toxicology.

(3) This individual shall be engaged in and responsible for the day-to-day management of the drug testing laboratory even where another individual has overall responsibility for an entire multi-specialty laboratory.

(4) This individual shall be responsible for ensuring that there are enough personnel with adequate training and experience to supervise and conduct the work of the drug testing laboratory. He or she shall assure the continued competency of laboratory personnel by documenting their in-service training, reviewing their work performance, and verifying their skills.

(5) This individual shall be responsible for the laboratory's having a procedure manual which is complete, up-to-date, available for laboratory personnel, and followed by those personnel. The procedure manual shall be reviewed, signed, and dated by this responsible person whenever procedures are first placed into use or changed or when a new individual assumes responsibility for management of the drug testing laboratory. Copies of all procedures and dates on which they are in effect shall be maintained.

(6) This individual shall be responsible for maintaining a quality assurance program to assure the proper performance and reporting of all test results; for maintaining acceptable analytical performance for all controls and standards; for maintaining quality control testing; and for assuring and documenting the validity, reliability, accuracy, precision, and performance characteristics of each test and test system.

(7) This individual shall be responsible for taking all remedial actions necessary to maintain satisfactory operation and performance of the laboratory in response to quality control systems not being within performance specifications, errors in result reporting or in analysis of performance testing results. He or she shall ensure that specimen results are not reported until all corrective actions have been taken and he or she can assure that the results provided are accurate and reliable.

**Recommendation 38** – Laboratories must maintain physical security and CCF procedures consistent with Sec 2.4a of Guidelines which state:

***Laboratory Analysis Procedures – Security and Chain of Custody***

- (1) Drug testing laboratories shall be secure at all times. They shall have in place sufficient security measures to control access to the premises and to ensure that no unauthorized personnel handle specimens or gain access to the laboratory processes or to areas where records are stored. Access to these secured areas shall be limited to specifically authorized individuals whose authorization is documented. With the exception of personnel authorized to conduct inspections on behalf of Federal agencies for which the laboratory is engaged in testing or on behalf of the Secretary or emergency personnel (e.g., firefighters and medical rescue teams), all authorized visitors and maintenance and service personnel shall be escorted at all times. The laboratory shall maintain a record that documents the dates, time of entry and exit, escort and purpose of entry of authorized visitors, maintenance personnel, and service personnel accessing secured areas.
- (2) Laboratories shall use chain of custody procedures to maintain control and accountability of specimens from receipt through completion of testing, reporting of results, during storage, and continuing until final disposition of specimens. The date and purpose shall be documented on a laboratory chain of custody form each time a specimen is handled or transferred, and every individual in the chain shall be identified. Accordingly, authorized technicians shall be responsible for each specimen or aliquot in their possession and shall sign and complete appropriate entries on the laboratory chain of custody forms for those specimens or aliquots as they are received.

**Recommendation 39** – Laboratories must use specimen receiving, accessioning, and storage procedures consistent with Secs 2.4b,c,d of The Guidelines which state:

**Receiving**

(1) After opening a shipping package and gaining access to a specimen and its accompanying 1 CCF, an accessions shall compare the information on the specimen bottle label/seal to the information on the accompanying CCF.

(2) The following discrepancies are considered to be fatal flaws and the laboratory must stop the testing process and reject the specimen for testing and indicate the reason for rejecting the specimen on the CCF:

(i) The specimen ID number on the specimen bottle label/seal does not match the ID number on the CCF or the ID number is missing either on the CCF or on the specimen bottle label/seal;

(ii) The specimen bottle label/seal is broken or shows evidence of tampering on the specimen bottle from a single specimen collection or on the primary (Bottle A) specimen from a split specimen collection (and the split specimen cannot be designated as the primary (Bottle A) specimen);

(iii) The collector's printed name and signature are omitted on the CCF; or

(iv) There is an insufficient amount of oral fluid for analysis in the specimen bottle from a single specimen collection or in the primary (Bottle A) specimen from a split specimen collection (unless the split specimen can be designated as the primary (Bottle A) specimen).

(3) The following discrepancy is considered to be a correctable flaw:

(i) If a collector failed to sign the CCF, the laboratory must attempt to recover the collector's signature before reporting the test result. If the collector can provide a memorandum for record recovering the signature, the laboratory may report the test result for the specimen. If the laboratory cannot recover the collector's signature, the laboratory must report a rejected for testing result and indicate the reason for the rejected for testing result on the CCF.

(4) Specimen bottles will normally be retained within the laboratory's accession area until all analyses have been completed. Aliquots and laboratory chain of custody forms shall be used by laboratory personnel conducting initial and confirmatory tests while the original specimen bottles and CCFs remain in secure storage.

**Short-Term Refrigerated Storage.** Specimens that do not receive an initial test within 7 days of arrival at the laboratory shall be placed in secure refrigeration units. Temperatures shall not exceed 6[deg]C. A certified laboratory must have the capability to ensure proper storage conditions in the event of a prolonged power failure.

**Specimen Processing.** A laboratory will normally process specimens by grouping them into batches. The number of specimens in each batch may vary significantly. Every batch shall satisfy the quality control requirements in section 2.5.

### **Section 9 – Laboratory Cutoff Concentrations – Screening**

There are no specific cutoff concentrations required for screening assays. An FDA cleared method for screening with associated cutoff concentrations specified by the manufacturer should be used. Presently, there is no standardization between device manufacturers; consequently, screening cutoff concentrations may vary between manufacturers. Some manufacturers may specify a range of concentrations for specific drugs/metabolites allowing the laboratory to set screening cutoff concentrations that optimally match confirmation cutoff concentrations. Other manufacturers may have optimized screening cutoff concentrations at specific concentrations for confirmation procedures. It will be the obligation of the laboratory to evaluate the performance of screening assays for optimization to confirmation cutoff concentrations.

#### *Section 9 Recommendations*

**Recommendation 40** – Furthermore, the FDA cleared method for testing oral fluids for drugs of abuse shall utilize a collection device that has been FDA cleared to be compatible to the FDA cleared testing method.

**Recommendation 41** – Initial Test Cutoff Concentrations may vary between screening assays. Initial cutoff values must be those stated in the FDA cleared method.

### **Section 10 – Laboratory Cutoff Concentrations – Confirmation**

Confirmation using appropriate Gas/Liquid Mass Spectrometric methods is required using the following cutoff values specified below. Confirmation cutoff concentrations are those proposed by DHHS for neat oral fluid testing with three exceptions: 1) The cutoff concentration for phencyclidine was changed to 2 ng/mL; 2) No requirement is specified for the detection of amphetamine at LOD; and 3) d/l isomer differentiation is required for all methamphetamine positives.

#### *Section 9 Recommendations*

**Recommendation 42** – A specimen identified as positive on an initial drug screening test must be confirmed for the class(es) of drugs screened positive on the initial drug test using appropriate Gas/Liquid mass spectrometric methods.

**Recommendation 43** – Each confirmatory drug test shall provide a quantitative result.

**Recommendation 44** – Delta-9-Tetra-hydrocannabinol [THC]<sup>1</sup>: 2 ng/mL

**Recommendation 45** – Cocaine (Cocaine or Benzoylcegonine)<sup>1</sup>: 8 ng/mL

**Recommendation 46** – Opiates<sup>1</sup>:

- Morphine: 40 ng/mL
- Codeine: 40 ng/mL
- 6-Acetylmorphine: 4 ng/mL

**Recommendation 47** – Phencyclidine: 2 ng/mL

The rationale for the lower cutoff concentration for phencyclidine arises from the study by Cone et al.<sup>2</sup> that only 57% of positive specimens were detectable at a confirmation cutoff concentration of 10 ng/mL.

**Recommendation 48** – Amphetamines:

- Amphetamine: 50 ng/mL
- Methamphetamine (d/l isomer differentiation is required for all methamphetamine positives): 50 ng/mL
- MDMA, MDA, MDEA: 50 ng/mL

The rationale for the elimination of the requirement for detection of amphetamine at LOD for all positive methamphetamines arises from the study by Schepers et al.<sup>3</sup> who showed that numerous false negative results occurred because of this requirement. The study showed that some subjects did not produce detectable amphetamine for up to eight hours following methamphetamine administration. The rationale for the requirement for d/l isomer differentiation for all positive methamphetamine specimens arises from concern that nasal decongestants containing l-methamphetamine may produce positive specimens by oral contamination from the nasal cavity. Until scientific studies can be conducted that rule out this possibility, it seems prudent to require d/l isomer differentiation.

While we have focused on the drugs listed above, this should not limit the inclusion of other drugs of abuse.

**Recommendation 49** – Split Specimen Confirmation: If split specimens are collected, testing of the “split” specimen must confirm initial results at LOD.

**Section 11 – Laboratory – Atypical Specimens**

The collection procedure (initial waiting period, inspection of oral cavity, observed collection) is expected to reduce or eliminate attempts to adulterate or substitute specimens. Further, initial studies have generally found that common household ingredients that may be placed in the mouth do not present assay problems in oral fluid testing. However, all possibilities have not been investigated. The laboratory is required to continually evaluate the quality of received specimens for unusual characteristics for evidence of adulteration and substitution.

All atypical specimens should be investigated to determine root cause and if found unsuitable for testing, be reported to the MRO as “rejected”. Examples are as follows:

*Section 10 Recommendations*

**Recommendation 50** – Unusual physical attributes

**Recommendation 51** – Abnormal screening results

**Recommendation 52** – Inadequate recovery of internal standard in confirmation process

**Section 12 – Laboratory – Reporting of Results**

*Section 11 Recommendations*

**Recommendation 53** – The laboratory should report all confirmed-positive tests and specimens rejected for testing to the MRO in an expeditious manner.

**Recommendation 54** – The laboratory may transmit results to the MRO by various electronic means (e.g. teleprinters, facsimile, or computer) in a manner designed to ensure confidentiality of the information. Results may not be provided verbally by telephone. The laboratory must ensure the security of the data transmission and limit access to any data transmission, storage, and retrieval system.

**Section 13 – Laboratory – Specimen Storage**

*Section 12 Recommendation*

**Recommendation 55** – All confirmed-positive specimens must be stored in long-term frozen storage (-20[deg]C or less) for a minimum of one year.

## **Section 14 – Laboratory – Retesting**

### *Section 13 Recommendation*

**Recommendation 56** – A second laboratory shall use its confirmatory drug test at the limit of detection [LOD] when retesting an aliquot of a single specimen or split (B) specimen for the target drug or drug metabolite.

## **Section 15 – Laboratory – QA-QC**

### *Section 14 Recommendation*

**Recommendation 57** – To the extent possible, laboratories must perform quality control and assurance practices that are consistent with Sec. 2.5a,b,c of The Guidelines which state:

### ***Quality Assurance and Quality Control***

- (a) *General*. Drug testing laboratories shall have a quality assurance program which encompasses all aspects of the testing process including but not limited to specimen accessioning, chain of custody, security and reporting of results, initial and confirmatory testing, certification of calibrators and controls, and validation of analytical procedures. The performance characteristics (e.g., accuracy, precision, limit of detection (LOD), limit of quantitation (LOQ), specificity) shall be documented for each test as appropriate. Validation of procedures shall document that carryover does not affect the donor's specimen results. Periodic re-verification of analytical procedures is required. Quality assurance procedures shall be designed, implemented, and reviewed to monitor the conduct of each step of the testing process.
- (b) **Laboratory Quality Control Requirements for Initial Drug Tests.**  
Each analytical run of specimens to be screened shall include:
- (1) Sample(s) certified to contain no drug (i.e., negative samples);
  - (2) At least one control fortified with drug or metabolite targeted at 25 percent above the cutoff;
  - (3) At least one control fortified with drug or metabolite targeted at 75 percent of the cutoff;
  - (4) A sufficient number of calibrators to ensure and document the linearity of the assay method over time in the concentration area of the cutoff. After acceptable values are obtained for the known calibrators, those values will be used to calculate sample data;
  - (5) A minimum of 10 percent of the total specimens and quality control samples in each analytical run shall be quality control samples; and
  - (6) One percent of each run, with a minimum of at least one sample, shall be the laboratory's blind quality control samples to appear as routine specimens to the laboratory analysts.
- (c) ***Laboratory Quality Control Requirements for Confirmatory Drug Tests.***  
Each analytical run of specimens to be confirmed shall include:
- (1) Sample(s) certified to contain no drug (i.e., negative samples);
  - (2) Positive calibrator(s) and control(s) fortified with drug or metabolite;
  - (3) At least one control with drug or metabolite targeted at 25 percent above the cutoff; and
  - (4) At least one calibrator or control that is targeted at or below 40 percent of the cutoff.

<b>Section 16 – Laboratory – PT Programs</b>
<i>Section 15 Recommendation</i>
<b>Recommendation 58</b> – Laboratories conducting oral fluid drug testing must participate in independent external oral fluid proficiency testing programs.
<b>Section 17 – Rejecting Specimens – Fatal Flaws</b>
Following discrepancies are considered <b>fatal flaws</b> which require the rejection of a specimen:
<i>Section 16 Recommendations</i>
<b>Recommendation 59</b> – Specimen ID on label/seal does not match ID on CCF or the ID number is missing on either the CCF or the specimen label/seal.
<b>Recommendation 60</b> – Specimen label/seal is broken or shows evidence of tampering on the primary specimen and split specimen cannot be re-designated as primary.
<b>Recommendation 61</b> – Collector’s printed name and signature are omitted on CCF
<b>Recommendation 62</b> – Insufficient amount of specimen/sample for analysis in the primary specimen unless the split can be re-designated as primary.
<b>Section 18 – Rejecting Specimens – Correctable</b>
Following discrepancies are considered to be <b>correctable</b> :
<i>Section 17 Recommendations</i>
<b>Recommendation 63</b> – If collector has failed to sign the CCF, laboratory must attempt to recover signature before test result. If collector can provide a memo for record recovering signature, laboratory may report test result. If not, laboratory must report a rejected for testing result and indicate reason on CCF.
<b>Recommendation 64</b> – If there is no donor signature on CCF for a positive test, the MRO shall seek a statement of correction.

## REFERENCES

1. On April 13, 2004, the Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA) published a notice for public comment in the Federal Register (vol. 69, number 71, pages 19673-19732) that proposed scientific and technical revisions to the Guidelines for the testing of oral fluid, hair, and sweat patch.
2. E.J. Cone, L. Presley, M. Lehrer, W. Seiter, M. Smith, K. Kardos, D. Fritch, S. Salamone, and R.S. Niedbala. Oral fluid testing for drugs of abuse: Positive prevalence rates by Intercept<sup>TM</sup> immunoassay screening and GC-MS-MS confirmation and suggested cutoff concentrations. *J. Anal. Toxicol.* **26**: 541-546 (2002).
3. R.J. Schepers, J.M. Oyler, R.E. Joseph, Jr., E.J. Cone, E.T. Moolchan, and M.A. Huestis. Methamphetamine and amphetamine pharmacokinetics in oral fluid and plasma after controlled oral methamphetamine administration to human volunteers. *Clin. Chem.* **49**: 121-132 (2003).



