CS-PM 1 General Information & Safety

1.1 Introduction

The Controlled Substances Procedures Manual describes the methodology, techniques, and procedures to be used for the examination and analysis of seized drug evidence by all forensic scientists working in the Controlled Substances Units.

This manual is not all-inclusive, and the procedures covered specifically do not preclude the use of any other validated methods. The scientist is responsible for the selection of an analytical scheme and the analytical tools appropriate for each case.

The analysis of seized drug evidence may be accomplished by a variety of methods. No single standard procedure must be followed to identify a particular drug. In seized drug analysis, a combination of screening tests, selective tests and specific tests are used. Additionally, the analyst will select the appropriate extraction methods, instrumental techniques, reference materials and procedural controls given the analytical protocol selected.

Any new methodology developed or major modifications to established analytical methods must be validated according to the requirements of Forensic Science Division Laboratory Operations Manual LOM-2.9 Validation and Verification. Deviation from the requirements set forth for substance identification in this manual is not to occur without the approval of the Technical Leader or designee.

1.2 Controlled Substances Safety Plan

1.2.1 Scope

This policy applies to FSD Controlled Substances Units and personnel assigned to or doing business with FSD Controlled Substances Units. This policy also describes safety requirements specific to Controlled Substances Unit. These requirements are in addition to all requirements described in the Forensic Science Division Health and Safety Manual.

1.2.2 Responsibility

All FSD employees shall demonstrate responsibility for health and safety and know and follow FSD and local laboratory safety policies, plans, and procedures. This is in addition to the responsibilities listed in SM1.

Unit Supervisors shall promote safe practices in Controlled Substances Units and shall ensure that employees and guests of the laboratory know and follow all FSD and local laboratory safety policies, plans, and procedures.

This is in addition to the responsibilities listed in SM1.

1.2.3 Terminology

Personal Protective Equipment (PPE) refers to equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses that could result from contact with chemical, physical or other workplace hazards.

Examination area (also Laboratory area) refers to any workspace in which evidence is opened or chemical processes are used.

Instrument room refers to any workspace in which instrumentation is physically isolated from other laboratory areas, and small samples of chemical materials are contained in vials or tubes.

1.2.4 General Precautions

General precautions are appropriate for handling and analysis of most submissions of powder, plant material, solid dosage units, and liquids.

Precautions should be scaled according to the hazards presented by increased purity, quantity, or nature of the suspected substance.

Personnel should assume that all substances of unknown hazard are hazardous.

Analysts should avoid performing chemical procedures while alone in the laboratory.

Eating, drinking, and applying cosmetics are prohibited in drug evidence storage areas and in all areas in which chemicals are present. This includes instrument rooms.

Food, beverages, chewing gum, and other consumable items are prohibited in drug evidence storage areas and in all areas in which chemicals are present. This includes instrument rooms. This does not apply to evidentiary items.

1.2.4.1 PPE

Lab coat and safety glasses are the minimum required personal protective equipment (PPE) for entry into drug analysis examination areas and instrument rooms. This requirement applies to all laboratory personnel, visitors and vendors.

Gloves, in addition to lab coat and safety glasses, are required for handling of open or unsealed seized drug evidence items.

Gloves, safety glasses, and lab coat are the minimum PPE required for active examination of all seized drug casework, chemical reagent handling, and handling of drug reference standards.

Chemical safety goggles are required for processes that present a splash hazard.

1.2.4.2 N95 and Mask Respirators

An approved and fitted N95 filtering face piece or ½ mask air purifying respirator is required for active handling and examination of all seized drug materials that are in a form that could become airborne OR that could present a respiratory hazard due to loose powder, dust, particulates, or spores. Some examples of these materials are:

a) Powders
b) High hazard materials
c) Moldy plant materials

This requirement applies to all stages of the examination process for these materials. Refer to SM2.2.8 for the required prior authorization process for N95 and half-mask APR.

1.2.4.3 Glove-Free Areas

Each Controlled Substances Unit shall designate by signage and verbal notification of personnel if specific areas and pieces of equipment in the laboratory area and instrument room are “glove free”.

For example, laboratory area telephones should be signed “No Gloves” if so designated. Glove-free equipment shall not be handled with gloved hands.

Signage should be visible and should be large enough to be easily recognized and read by users of the equipment.

1.2.4.4 Computers

To prevent inadvertent transfer of hazardous materials, computers, laptops, and computer peripheral devices should not be moved to or from office and laboratory area workstations.

A remote terminal should be used at analytical workstations to provide access to laboratory information systems.

If a computer, laptop, or computer peripheral device must be moved between a laboratory area and office area, the following practices shall be implemented when practicable:

a) gloves shall not be worn when typing, handling, or otherwise interacting with the computer or device
b) laptops must be kept closed in laboratory areas
c) laptops and peripheral devices must be physically separated or isolated from laboratory area workspaces such as by placement upon a high shelf
d) outer surfaces of laptops, computers, and peripheral devices must be thoroughly cleaned with a disinfectant wipe prior to moving the device from a laboratory area to another location.

1.2.4.5 Evidence Reception Areas

Telephones and signature pads in evidence reception areas shall be handled glove free, and do not need signage.

Computer keyboards and peripherals used for evidence reception purposes shall be considered glove free unless manipulated with gloves and marked as "gloves required".

1.2.5 Housekeeping Procedures

1.2.5.1 Responsibilities

Each employee is responsible for the housekeeping and general tidiness of his or her own workspace. Laboratory personnel are jointly responsible for housekeeping of shared laboratory spaces.

Laboratory management shall insist upon maintenance of housekeeping standards consistent with the recommendations of the FSD Health and Safety Officer, the FSD Health and Safety Program, and the Controlled Substances Safety Plan.

Each employee shall keep work areas clean and uncluttered.

1.2.5.2 General Practices

In order to minimize inadvertent exposure to possible safety hazards associated with seized drug evidence, the following procedures shall be employed when practicable:

a) Clean paper shall be used to cover the area of the work surface upon which specimens and exhibits may be inventoried, examined, transferred, or sampled.
b) A new, clean piece of paper shall be used for each new or unrelated item of evidence inventoried, examined, or sampled.
c) Work surfaces and equipment will be cleaned on a regular basis. Refer to CS-APP 1.2 for the procedure for cleaning surfaces and CS-PM 4.2 for the procedure for cleaning balances.

1.2.5.3 Frequency of Cleanings

Work areas and tools shall be cleaned at the completion of each work operation, and between examinations of unrelated items of evidence.

Equipment shall be cleaned as soon as practical in the event of a spill or observation of potentially hazardous material.

Shared laboratory work areas and equipment shall be cleaned on a weekly basis.

Instrument room workspaces shall be cleaned on a monthly basis.

Evidence Reception area surfaces should be cleaned between work operations involving seized drug evidence reception or transfer.

1.2.5.4 Documentation

Record of weekly and monthly cleaning shall be made by using the Qualtrax Housekeeping Workflow.

1.2.6 Moldy Plant Material

1.2.6.1 Recognition

Moldy plant material may be recognized by discoloration of exterior packaging, characteristic moldy or decaying odor, and visual recognition.

1.2.6.2 Primary Hazard to Personnel

Inhalation of mold spores

1.2.6.3 Precautions

a) Wear an approved and fitted N95 filtering face piece or ½ mask air purifying respirator for active handling and examination of plant materials that are in a form that could become airborne or that could present a respiratory hazard due to dust, fine particulates, or spores.

b) Analyze moldy plant material in an operating chemical fume hood.

   If no operating fume hood can accommodate the volume of moldy material to be analyzed, the material will not be analyzed.

c) Promptly return moldy plant material to the submitting agency to prevent accidental exposure of personnel to mold spores during prolonged storage.

Exception: weight measurement of moldy plant material outside of a chemical fume hood is permissible if movement, transfer, and weighing operations do not present or increase the apparent risk of airborne material.

NOTE: Apparent risk of airborne material may be determined by general appearance, observed presence of airborne materials upon opening, or experience-based risk assessment by the analyst or supervisor.

1.2.7 Powder Specimens

1.2.7.1 Recognition

Powder specimens are solid at room temperature and composed of fine, loose particles that may flow when tilted or become airborne when stirred.

Fentanyl, fentanyl related compounds, and synthetic opioids are not easily visually recognized amongst other chemicals or white powders. The Marquis test produces an orange color with fentanyl after several minutes.

1.2.7.2 Primary Hazard to Personnel

Inhalation or absorption through skin for some analytes.

1.2.7.3 Precautions

Precautions should be scaled according to the purity, quantity, or nature of the suspected substance.

One of the following methods should be used to reduce the risk of exposure to powdered or airborne materials and should be applied in cases with the potential of increased safety hazard.

Documentation shall be made in the case record if either method is used and shall include the method and reason for use.

Method 1 – Gross Weight

a) Obtain a gross weight if the item weighs less than 50 grams.
b) Collect samples for analysis through a small hole made in the innermost packaging.
c) Upon withdrawal of samples, the innermost packaging should be resealed.
d) Change gloves upon sealing evidence.
e) Clean lab surfaces upon changing gloves.
f) Change gloves again before handling tools, equipment, or touching other lab surfaces.

Method 2 – Weight by Subtraction of Package

a) Obtain a gross weight of the specimen with inner-most layer of packaging.
b) In an operating chemical fume hood, remove the specimen from its packaging and transfer it to a heat-sealed bag or other laboratory container.
c) Obtain the weight of the empty packaging.
d) The weight of the specimen is determined by the difference between the measured gross weight and the weight of the packaging.

NOTE: Measurement uncertainty for this method will be calculated according to the procedure for measurement uncertainty with multiple specimens.

1.2.7.4 Hazard Control Considerations for Powder Specimens

Use an operating chemical fume hood to control exposure to airborne or volatile material. Do not open or "dump out" powder specimens outside of the chemical fume hood.

Keep bricks or containers of bulk material in an operating chemical fume hood during examination when practicable.

Cover any exposed skin of hands and forearms, such as by firmly tucking lab coat cuffs into gloves.

Wear eye protection during the handling and examination of any case.

When handling powder specimens, wear an approved and fitted N95 filtering face piece or half-mask air purifying respirator. Refer to SM2.2.8 for the required prior authorization process for N95 and half-mask APR.

1.2.7.5 Specific Precautions for High Hazard Materials

High hazard materials are defined in SM4. High hazard materials pose an elevated health risk in the event of an exposure. Examples of high hazard materials are carfentanil and fentanyl.

All high hazard materials shall be stored and transported in sealed containers. Refer to SM4.

High hazard compounds shall only be examined when at least two FSD personnel are present in the Controlled Substances Unit.

The examination, processing, and analysis of high hazard materials shall be performed in a manner that limits the release of powder into the air or onto work surfaces and equipment. Refer to SM4.

When handling high hazard materials in a powdered state, an approved and fitted N95 filtering face piece shall be worn.

Alternatively, an approved and fitted half-mask air purifying respirator may be worn.

Refer to SM2.2.8 for the required prior authorization process for N95 and half-mask APR.

Personnel present in the examination area during an ongoing examination of high hazard materials shall wear the same level of PPE as the analyst performing the examination.

Laboratory personnel shall remain alert to symptoms of opioid exposure in themselves and others.

The symptoms of opioid exposure

SHALLOW or SLOW BREATHING

SMALL PUPILS

Dizziness

Drowsiness

Weakness

If symptoms of exposure are present, call 911 and administer applicable first aid.

If a high hazard material is detected in an item of evidence, the outermost evidence container shall be labeled with the name of the substance on this list that was detected or identified.

This labeling shall take place before storage or transfer. If an external container is already sufficiently labeled, it is not necessary to apply a duplicate label.

1.2.8 Separating Packaging for Submission to Other Units

Drug evidence should not be separated from packaging in the evidence reception area.

It is not required to separate drug evidence from its packaging for Latent Print examination if it is deemed hazardous to do so. Agencies may request approval from the Laboratory Director or Latent Print Unit Supervisor to submit unseparated evidence.

If Latent Print examination is requested and the evidence was submitted unseparated due to safety concerns, the evidence should be submitted for Controlled Substances examinations first.

At time of submission, the customer should specify if latent print examinations are to be done on the packaging of sub-items tested in the Controlled Substances Unit or if all sub-items are to be examined for latent prints. This customer specification will be documented in the case record.

The packaging should be separated by Controlled Substances Unit personnel and shall be fully documented and treated as laboratory generated evidence in Forensic Advantage.

As laboratory generated evidence, the packaging may then be transferred to the Latent Print Unit upon completion of the analysis of the specimen.

Packaging that contained any amount of a high hazard material shall not be transferred to any other unit in the laboratory. Further, packaging of other unanalyzed sub-items present with an exhibit containing any amount of a high hazard material shall not be transferred to any other unit in the laboratory. Exceptions may be made when deemed appropriate following consultation with the Laboratory Director and Health and Safety Officer.

Refer to SM4 for container labeling requirements before storage or transfer of evidence.

1.2.9 Liquid Specimens

1.2.9.1 Recognition

Liquid specimens are fluid and often have the appearance of water or oil at room temperature.

1.2.9.2 Primary Hazard to Personnel

Skin contact or inhalation of volatile components

1.2.9.3 Precautions

As far as practicable, examine, measure and sample all liquid specimens in an operating chemical hood.

Repackage liquid specimens in a manner that minimizes the potential for breakage of containers and leakage of contents.

1.2.10 E-Cigarettes

1.2.10.1 Background

A vape pen or e-cigarette is a device which uses a power source (generally a lithium-ion battery) to heat and vaporize a liquid cartridge for the purpose of inhalation. The liquid cartridge may contain non-controlled consumer products such as nicotine and flavorings.

Additionally, e-cigarettes are known to be modified to vaporize controlled substances, particularly cannabis products. These products are frequently modified by consumers who alter the battery system to increase the heat of vaporization and subsequent volume of vapor.

1.2.10.2 Hazards

The primary hazards to FSD members from e-cigarettes submitted for analysis include the following:

Vapors

If the e-cigarette is activated (intentionally or unintentionally), the device may vaporize any controlled substances contained within the device. Non-controlled substances sold for use in e-cigarettes are known to contain a number of potentially hazardous substances such as nicotine, respiratory irritants such as propylene glycol and toxic byproducts of combustion such as formaldehyde. All of which pose a potential employee exposure risk. The American Industrial Hygiene Association published a white paper on this subject in 2014.

Absorption

Nicotine (and potentially other products) used in the e-cigarette can be readily absorbed through the skin.

Fire and Explosion

Lithium-ion batteries can explode or catch fire if handled or stored improperly. Additionally, modifications to e-cigarettes and battery components increase the risk of fire or explosion. While battery failures are statistically rare, the consequences could be severe. For more information on lithium battery hazards associated with e-cigarettes see Appendix 1 in FEMA's "Electronic Cigarette Fires and Explosions in the United States 2009-2016" document. Appendix 2 of that document outlines reported fires and explosions.

1.2.10.3 Precautions and Control Measures:

Wear disposable nitrile gloves while handling any e-cigarette or e-cigarette component.

Remove batteries from e-cigarettes during storage and analysis. This will eliminate the risk of fires and explosions as well as inadvertent activation of the battery during handling of the device.

Call the Bomb Squad to evaluate any homemade or suspicious-looking e-cigarette device prior to acceptance into the laboratory.

1.2.11 Extreme Precautions

Some chemicals require enhanced precautions and elevated levels of chemical protective clothing and training.

For this reason, the Laboratory Director or designee shall authorize the acceptance of submissions of large, bulk quantities of known or suspected high hazard materials for laboratory examination.

Submissions of large quantities of high hazard materials shall not be accepted unless the laboratory has sufficient ability to isolate the analysis and analysts have been approved to wear respirators.

The Laboratory Director or designee is encouraged to consult with the Controlled Substances Unit Supervisor and/or FSD Health and Safety Officer with regards to the laboratory's ability to safely complete the request for analysis of any submission of high hazard materials.

Additional acceptance criteria may be adopted by the Laboratory Director upon recommendation of the Controlled Substances Unit Supervisor and/or FSD Health and Safety Officer.

Laboratory personnel should notify the Controlled Substances Unit Supervisor before opening, analyzing, or otherwise examining large amounts of powdered evidence suspected to contain a high hazard material.

1.2.12 Safety References

FSD Health and Safety Program

FSD Safety Alert 8 – 09/06/2016

https://www.osha.gov/SLTC/personalprotectiveequipment/ September 8, 2016.

FSD Naloxone Instructions

1.2.13 Appendix

CS-APP 1.2 Procedure for Cleaning Laboratory Surfaces

CS-PM 4.2 Procedure for Cleaning a Balance

1.3 General Continuing Education of Personnel

It is the responsibility of Controlled Substances analysts to continue their education related to analytical techniques and protocols, and other topics in seized drug analysis.

Each analyst is encouraged to attend workshops, forensic meetings, and to read relevant books and journals. Journal articles with an emphasis on forensic science, court testimony, and controlled substances can be accessed under Discipline-Controlled Substances-Resources-Articles.

1.4 Case Assignments

1.4.1 Summary

Guidelines are provided to minimize operational and ethical risks associated with arbitrary or unmonitored case assignment. Laboratory Managers retain responsibility for ensuring that case assignments are made to provide effective service while minimizing risk associated with biased assignment of cases.

1.4.2 Background & Terminology

Analysts who retrieve drug evidence from storage at will and without oversight or guidance may use unreasonable criteria to assign specific cases to themselves or others. This type of biased case assignment could limit operational effectiveness or provide opportunities for unethical behaviors.

In this policy, “biased case assignment” refers to an unreasonable, systematic and preconceived preference or intention to assign cases of a particular type, size, or analyte to a particular individual (or oneself) for analysis.

By reducing biased case assignment, laboratories can ensure effective, timely service for all cases.

1.4.3 Case Assignment Protocol

Cases should be assigned to individuals for analysis according to one of the following methods.

The risks associated with each method of case assignment should be considered by managers, and case assignment methods may change in light of operational, personnel, safety, or other environmental factors at the laboratory.

1) Auto-assignment by Forensic Advantage according to a predetermined rotation.
2) Self-assignment by the individual according to the following rules:
    a. Oldest submission dates shall be taken first.
    b. Priority cases may be taken out of order on a case-by-case basis.
3) Supervisor assignment of cases to individuals according to the following rules:
    a. Oldest submission dates shall be assigned first.
    b. Priority cases may be taken out of order on a case-by-case basis.

1.4.4 Responsibilities of Managers

Laboratory managers are responsible for:

1) Monitoring incoming cases and backlog
2) Prioritizing cases for analysis
3) Ensuring equitable and appropriate case distribution
4) Monitoring self-assignment of cases for signs of assignment bias
5) Ensuring that opportunities for bias assignments are minimized
6) Adjusting case assignments and assignment methods as needed to ensure effective laboratory operations

1.4.5 Considerations

There are risks and benefits in each case assignment strategy. Managers should remain aware of the workflow in the laboratory and adjust assignments accordingly. Assignment decisions should be made so as to minimize both operational bottlenecks and biased case assignments.

Laboratories that employ many analysts may find the auto-assignment in FA to be an efficient method to assign casework. This strategy minimizes biased assignments, but the lab manager must monitor backlogs of each team member to ensure the casework is being completed efficiently.

Laboratories that employ fewer analysts may maintain efficiency by self-assigning the oldest cases on the day the individual intends to work on those cases. Managers should monitor each team member's cases by reviewing the completion records. Managers using this strategy must also ensure that biased case assignment is held to a minimum and that all assignments adhere to the policies of the laboratory.

In every laboratory, some analysts may complete more cases than other analysts in a given time frame. Supervisors will monitor these situations and adjust the case assignments to the benefit of the team and to meet goals of the laboratory.