

**Rhode Island Department of Health
Division of Laboratories**



Center for Forensic Sciences

Laboratory Service Manual

“Science in the Service of Justice”

**RHODE ISLAND DEPARTMENT OF HEALTH
CENTER FOR FORENSIC SCIENCES
LABORATORY SERVICE MANUAL**

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Introduction

The Center for Forensic Sciences (CFS) was established in 1938 as part of the Rhode Island Department of Health (RI DOH) Division of Laboratories under state statute §23-1-8. The mission of CFS is to examine evidence and provide expert scientific opinion in legal and criminal cases for local law enforcement agencies, the RI Attorney General and the Office of the State Medical Examiner. CFS has implemented a quality management system to promote objective and impartial forensic testing.

This booklet is designed to make the process of submitting evidence to CFS easier and more efficient. If further information or guidance is needed, please contact the laboratory at the telephone numbers listed below.

Hours of Operation

Laboratory hours are 8:30 AM to 4:30 PM, Monday through Friday. Evidence receiving is open from 8:30-12:00. **Appointments are strongly recommended.** DUI/Toxicology submissions are accepted until 4:30 PM. To arrange for special assistance during non-business hours, please contact the laboratory.

Laboratory Location

The Center for Forensic Sciences (CFS) is located in the Chapin Laboratory Building at 50 Orms Street in Providence, Rhode Island. The Chapin Building houses the Department of Health State Laboratory (DOHSL) and the Medical Examiner's Office.

Mailing Address: Department of Health Laboratories
Forensic Science Laboratory
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Providence, RI 02904

Telephone: 401-222-5600 (Main Laboratory)
222-5593 (CFS Chief – Robin Fortunati, M.S.)
222-5551 (Breath Alcohol Testing – Albert Giusti, B.S.)
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Fax: 401-222-6985 (Main Laboratory)
222-5536 (Forensic Biology)
222-6064 (Drug Chemistry)
222-5566 (Forensic Toxicology)

CFS Website

Copies of this Manual and future updates may be obtained from the Department of Health website at www.health.ri.gov.

CFS Services

The main functions of CFS are to:

- Identify, compare and interpret physical and biological evidence
- Provide expert forensic testimony
- Advise court officials on the presentation of scientific evidence
- Provide instructions concerning laboratory operations and scientific techniques to law enforcement training schools and the public
- Maintain custody of physical evidence until testing has been completed

CFS is divided into the following four laboratory units:

1. Forensic Biology/DNA/CODIS
2. Drug Chemistry
3. Breath Analysis
4. Toxicology/Blood Alcohol (DUI/DUID)

CFS Administration is responsible for Information systems, Database Management and Quality Assurance.

Services Offered by CFS

[Alcohol Proof](#)

[Autopsy Specimens – Drug and Poison Analysis](#)

[Blood Alcohol Concentration](#)

[Blood Identification](#)

[Body Fluid Identification](#)

[Breath Alcohol Testing – Training and Certification of Police Officers](#)

[Breath Alcohol Testing – Certification of Breath Testing Instruments](#)

[CODIS Matching](#)

[Controlled Substance Identification](#)

[DNA Profiling](#)

[Driving Under the Influence of Alcohol \(DUI\)](#)

[Driving Under the Influence of Drugs \(DUID\)](#)

[Drug Assays](#)

[Product Tampering](#)

[Sexual Assault Evidence Collection Kits](#)

[Unknown Liquid/Beverage Testing](#)

Fees

Most laboratory examinations, court appearances and travel expenses are available to law enforcement agencies without charge. Requests for court appearances, training and public speaking should be made as far in advance as possible.

General Requirements for Evidence Submissions

Evidence is accepted at: **50 Orms Street, Providence, RI**
Monday – Friday 8:30 AM – 12:00 PM
(Drugs, Biology/DNA) 3rd Floor Room # 306

Monday – Friday 8:30 AM – 4:30 PM
DUI/Toxicology 3rd Floor- Room # 304

All evidence submissions should be connected to law enforcement or medical examiner case investigations. Evidence is not ordinarily analyzed for private individuals or corporations.

Several methods may be used to submit evidence to the laboratory. The method will depend on the type and size of the item, urgency and complexity of the case. The officer or individual submitting the evidence should take the proper precautions to prevent loss, damage and contamination of the evidence. Improperly packaged or labeled items may not be accepted for analysis. Please contact the laboratory with any questions related to evidence collection and/or submission. The laboratory can provide a list of recommended vendors of evidence collection/packaging supplies.

The following are general requirements for the submission of evidence. Please refer to individual services for specific evidence collection and submission requirements.

General

- All items of evidence submitted for testing should be identified with the case number, description of evidence and collection information.
- Tamper evident seals must be initialed or otherwise marked to document the person who sealed the evidence. Packaged evidence that is received with improper seals must be resealed at the time of submission before the item(s) will be accepted by the laboratory.
- Evidence should be maintained in a cool, dry location prior to submission to the laboratory. Any special storage requirements are described in the evidence collection guidelines for specific CFS services.

- Containers should be appropriately selected for each evidence type and adequately labeled, securely closed, and sealed. It may be necessary to place items in separate containers to prevent cross contamination.
- If warranted, place warning labels on the outer packaging of evidence (Biohazard, Chemicals, Glass, Sharp, etc.).
- Any wet plant material (such as marijuana plants, leaves, mushrooms, etc.) should be dried before packaging and transporting. Trapped moisture may cause the evidence to rot and be unsuitable for analytical testing.
- Vape pens are not accepted, but the liquid cartridge can be submitted.

Biohazards

In accordance with regulations established by the Occupational Safety and Health Administration (OSHA), all biohazard materials including blood specimens and other potentially infectious materials must be placed in leak-proof containers that will contain all contents and prevent leakage during handling, storage, and transport. The primary container must be placed in an outer shipping container with secondary leak-proof materials. The contents must be clearly labeled on the container.

Sharps and Syringes

Sharps are defined by OSHA as “any contaminated object that can penetrate the skin, including but not limited to, needles, scalpels, broken glass, broken capillary tubes and exposed ends of dental wires”. Sharps must be submitted in puncture proof containers. Syringes are not accepted; however, the contents of the syringe can be submitted when transferred to a vial. Please contact the Drug Chemistry laboratory to request a vial if needed.

Case Documentation

Each time evidence is submitted to CFS, an “Evidence Examination Request and Receipt” form must be completed. These forms are available at the laboratory and can also be downloaded from <http://www.health.ri.gov/laboratorytesting/about/forensicevidence/>.

The form includes the following information:

- Suspect Name
- Victim and Date of Birth
- Submitting Agency and County
- Agency Case Number
- Arresting Officer
- Date/Time of Occurrence
- Investigating Officer and Phone Number

- Juvenile or Federal Case Number (if applicable)
- Supplemental Submission Case Number
- Laboratory #/Date/Time
- Gross weight
- Item number
- Detailed description of each item of evidence
- Request for service/analysis*

* It is important that all services required for a complete analysis are requested at the time of submission in order to prevent damage or loss of evidentiary value. For example, some services must be performed in a particular order (ex. fingerprint analysis before DNA).

For DNA cases include a copy of the police report.

For DUI cases, the following information is also required:

- Suspect Address
- Date of Birth
- Time of Apprehension
- Medical Person Collecting Sample and Place of Employment
- Time of Sample Draw(s)
- Police Report

The submitting officer or individual must print and sign his/her name on the bottom of the Evidence Examination Request and Receipt form. The CFS employee receiving the evidence will acknowledge the receipt of evidence as purported to be and sign the form. CFS will retain the original and provide a copy to the submitting agency.

All information requested on the Evidence Examination Request and Receipt form must be complete and legible.

Resolution of Evidence Receiving Discrepancies

Whenever possible, CFS will attempt to resolve evidence receiving issues at the time of submission. If evidence has already been accepted by the laboratory and a discrepancy is noted, the corrected case submission contents will be reflected in the report.

Chain of Custody

CFS uses barcode technology to maintain a secure chain of custody for all evidence from the time of submission until time of release, transfer or destruction.

Return of Evidence

In most cases, evidence will be temporarily stored in the laboratory system until all services have been performed. Law enforcement agencies receive a notification that their evidence is ready for pickup after testing has been completed. It is advisable to notify the appropriate laboratory in advance so that it can be retrieved in a timely fashion. This includes evidence that may have been collected by another agency in connection with your case; for example, sexual assault kits that have been collected at hospitals. Please contact the laboratory concerning current evidence retention policies.

Case Reports

Case Reports may be mailed through the U.S. Postal Service, faxed to the submitting law enforcement agency, e-mailed or picked up in person with proper identification. If transmitted by fax, a follow-up copy of the report will be mailed. Additional requests for information/records can be made via telephone, mail, e-mail or facsimile.

Information that will appear on your final report:

- report title (e.g. “Summary of Analytical findings”)
- the name and address of the laboratory
- unique identification of all components that are recognized as a portion of a complete report and page numbering to clearly indicate the end of the report
- the name and department of the customer
- identification of the method used
- unambiguous identification of all test items submitted
- the date of receipt of the test item(s)
- the date of issue of the report
- a statement to the effect that the results relate only to the items tested
- the results with, where appropriate, the units of measurement
- identification of the person(s) authorizing the report
- clear identification when results are subcontracted

Information not normally included, but may be furnished upon request:

(note that all items in the following list are maintained in laboratory records)

- the date of sampling
- the date(s) of analysis
- reference to the sampling plan and sampling method used, if applicable
- additions to, deviations, or exclusions from the method
- customer address or phone number

Confidentiality

All case information and records are considered confidential. Only authorized individuals may access case records and related information. However, there may be instances when the laboratory may share case record information with other State agencies as required by law or statute. These agencies may include, but are not limited to, the Office of the State Medical Examiner, the RI Attorneys General and the Department of Transportation (DUI reporting).

Forensic Biology

The Forensic Biology (FB) Unit is comprised of Serology, DNA and CODIS sections. The main function of the FB Unit is to examine evidence obtained in sexual assault cases and other violent and non-violent crimes for the presence and identification of body fluids. When appropriately utilized, biological testing has the potential to supply information to:

- Link or eliminate a suspect with biological evidence
- Substantiate case circumstances
- Corroborate or refute an alibi
- Determine the sequence of events

Initially, items of physical evidence are examined for blood, semen or sources of DNA. Any trace evidence is collected and stored for future testing. Additional analyses performed are determined by the submitting agency's request, case circumstances, sample size and condition, available technology and/or conformance to CFS policies and procedures.

Services Currently Offered

Serology (routinely performed)	DNA Testing
seminal fluid ID	seminal fluid
presumptive saliva ID	saliva from envelopes, stamps, cigarette butts, cups,
blood ID	blood
	hairs (with roots)
	other – please contact the Forensic Biology Unit

* CFS can provide paternity testing in criminal cases only, such as child molestation or sexual assaults

Testing Times

Serological testing times are highly dependent on the numbers and types of evidence submitted. Longer times are usually necessary when initial examinations are negative and more extensive tests are required. Examination of multiple items may also increase testing times significantly. DNA analysis has an established protocol that must be followed to ensure the test's success and integrity of the results; therefore, "rush requests" are generally not accepted.

Serology

Blood Identification

Evidence suspected to contain blood will be examined to:

- Locate bloodstain(s)
- Confirm the presence of blood by chemical testing
- Perform DNA testing

Semen Identification

When evidence is submitted in a sexual assault case with an identified suspect, the evidence examination will include:

- Locating semen stains visually or with alternate light sources
- Acid phosphatase screening tests
- Microscopic examination for presence of spermatozoa
- Testing for other semen components in the absence of spermatozoa
- DNA typing when requested

If no suspect is identified, items submitted in a sexual assault kit will be examined for semen. If spermatozoa are present, DNA analysis will be performed and the male DNA fraction will be entered into the CODIS database for comparison.

Saliva Identification

When dried stains or questioned samples are submitted, evidence will be examined to:

- Locate stains visually or with alternate light sources
- Identify amylase (a chemical component of saliva)
- Evaluate potential of evidence to provide adequate DNA
- DNA typing when requested

DNA

DNA technology is used for the individualization of biological evidence in forensic casework. DNA has the potential to identify or eliminate an individual as the source of biological evidence. To complete an inclusion or exclusion interpretation, a buccal (cheek swab) or blood sample is required from both the victim and suspect. Samples from other persons suspected of involvement may also be relevant and elimination samples from property owners may be useful. Samples from victims may also be submitted for exclusionary purposes, including owners of stolen vehicles, homeowners, etc. In sexual assault cases, a known sample from a consensual partner may be necessary if voluntary sexual activity has occurred within 96 hours.

DNA typing can be used as an investigative or trial tool to:

- Identify the donor of biological evidence
- Exclude a falsely accused suspect
- Associate serial rapes or other series of similar crimes
- Distinguish multiple assailants in rape cases
- Determine victim identity when other identification is not available

Currently the FB Unit is performing DNA analysis using Short Tandem Repeats (STRs). This method is based on the Polymerase Chain Reaction (PCR) that targets specific sequences at numerous locations on the DNA molecule.

Y-STR testing is also available upon request. Y-STR testing is specific to the male DNA present in a sample and is most useful in cases where there is a large amount of female DNA which may be masking the male DNA. Y-STR's are not as discriminating as autosomal STR since all male relatives in the same paternal line will have the same Y-STR profile. Also, Y-STR profiles are not currently searched in CODIS, so there must be a suspect reference available for comparison.

Sexual Assaults

The FB Unit provides commercially prepared Sexual Assault Evidence Collection Kits (SAECKs) to local hospital emergency rooms in Rhode Island. These kits comply with the statewide medical examination protocols that have been developed for sexual assault victims. Currently, sexual assault testing is confidential, and victims do not have to file a police report in order for evidence to be collected.

If the victim of a sexual assault does file a police report, the police department must notify the FB Unit in order for testing to begin.

CODIS

CFS participates in the Federal Bureau of Investigation's COmBined DNA Index System (CODIS). This local, state and national database allows for the comparison of DNA profiles from forensic casework samples to those of previous offenders. The FBI provides CODIS as a database of DNA profiles collected from convicted offenders and arrestees. Also included in the database are "Forensic Unknowns", which are usually sperm DNA profiles from sexual assault cases and blood DNA profiles from homicide, burglary and assault cases. DNA profiles of unknown suspects can be searched against other unknown DNA profiles and/or convicted offender profiles to associate crimes or establish identities.

The FB Unit can enter DNA profiles from evidentiary items, suspects, arrestees, and convicted offenders into Rhode Island's state index (SDIS) and compare these files to DNA profiles from past and present CFS cases. With the exception of suspect profiles, the information in SDIS is eligible for

entry into the national DNA database (NDIS). These profiles will be compared to other forensic profiles as well as profiles from convicted offenders from other states contained within NDIS.

A complete administrative and technical review of sample data will be performed prior to entry into the CODIS database.

Victim, suspect and elimination DNA profiles are not uploaded into NDIS.

DNA profiles that are to be entered into CODIS must meet certain strict eligibility guidelines that have been determined by the FBI. In general, the following guidelines must be evaluated to determine eligibility of a profile for CODIS entry: (Note: This list is not all encompassing and final eligibility is determined by the State CODIS Administrator)

1. Documentation of a crime must be provided (i.e. police report).
2. The DNA profile must be developed from crime scene evidence (i.e. police report narrative documenting where evidence was seized from and how it is related to the crime).
3. The DNA profile must be suspected of originating from a putative perpetrator.
4. The DNA profile cannot be from an item that could reasonably be expected to contain the suspect's DNA, independent of the crime.
 - a. A DNA profile obtained from the following are generally NOT eligible for CODIS entry: clothing seized from suspects person/body, weapons seized from suspects person/house/car, cigarette butts, cups, gum etc., seized from suspect.
 - b. The following MAY be eligible for CODIS entry: hat/gloves/clothing/cigarette butt left behind at a crime scene which are suspected of being used/handled by perpetrator; tools and weapons suspected of being used to commit the crime being investigated; body fluids and fingerprint smudges left behind at scene of crime perpetrator; tools and weapons suspected of being used to commit the crime being investigated; body fluids and fingerprint smudges left behind at scene of crime
5. Reference buccal samples from homeowners, vehicle owners, boyfriends/consensual sexual partners should be submitted for elimination DNA testing.

Health and Safety Considerations

All biological evidence must be considered a potentially infectious biohazard. For this reason, adequate protective clothing should be worn, and proper evidence handling procedures should be followed. Disposable gloves should be worn when collecting and packaging evidence to protect against contact with potentially infectious pathogens. Gloves should be changed frequently to prevent cross-contamination of biological materials.

Physical Evidence Collection

To limit potential cross-contamination, collecting instruments should be thoroughly cleaned or replaced after each item of evidence is packaged. When collecting physical evidence, the entire object with questionable stains should be submitted whenever practical. If removal or transport of the entire object is not feasible, stained areas may be cut out or scraped. Small stains should be collected on sterile water-dampened cotton tipped swabs. It is essential that the swab is air dried before packaging. On items that have been cyanoacrylated, moisten the sterile cotton swab with acetone prior to swabbing.

The following are recommended guidelines only:

Evidence Collection on Large or Immovable Objects

Dry Stains:

1. Moisten sterile cotton tip swabs with distilled water
2. Rub swabs over stain until stain is picked up
3. Allow swabs to air dry
4. Package in clean paper, coin envelopes or similar
5. Seal so that tampering would be evident and place initials over seal
6. Clearly label outer package

Wet Stains:

1. Soak up stain with sterile cotton tip swabs or clean cotton sheeting (preferably not gauze)
2. Allow to air dry
3. Package in clean paper, coin envelopes or similar
4. Seal so that tampering would be evident and place initials over seal
5. Clearly label outer package

* Note: For large stains, use several swabs held closely together and coat each one evenly with stain. For smaller stains, use only one or two swabs and concentrate onto tip.

Evidence Collection – Small objects, clothing, bedding, etc.

1. If possible, use a UV light or Alternate Light Source (ALS) to view possible seminal fluid stains
2. If item is relatively small, collect the entire item
3. For large items (such as a couch) cut out stained area
4. Allow items to air dry – do not package wet items as this will increase degradation
5. Package in paper bags or paper wrapping and seal so that tampering would be evident

6. Place initials over seal and clearly label outer package

Packaging and labeling specimens:

All specimens collected shall be properly collected, packaged, and preserved as required in the Rules and Regulations and as described below. All specimens shall include appropriate identifying information such as the name and initials of the individual collecting the sample, the case number, and the date on which the sample was collected or transferred.

Known Standards for DNA Testing

Buccal

This will describe two methods of collecting a buccal sample. Buccal cells line the inner cheek inside the mouth and are a good source of DNA for reference samples. The process is relatively straightforward:

FTA Card Collection

FTA® Cards

Impregnated with chemical which traps, immobilizes, and stabilizes DNA
Protects DNA from breakdown
Infectious pathogens are rendered inactive upon contact
Can be stored at room temperature
DNA is stable for years
Available through GE Life Sciences or other vendors
Indicating FTA Micro Card # 120311 and
Sterile foam tipped applicators # 100032
(Alternative: EasyCollect #120462)

Items you will need for FTA Card collection:

Gloves
Evidence tape
Outer Packaging envelope
FTA Card
Foam tipped applicator

FTA Card Collection:

Have the subject remove any items contained in their mouth such as gum or candy.

1. Place FTA card on a clean, dry, flat surface. Label the FTA card with the subject's name, date of collection, and your initials.
2. Remove one Foam Tipped Applicator from the packaging.
3. Holding the plastic handle of the applicator, place the foam tip in the subject's mouth and rub one side of the tip on the inside of the cheek for at least 10 seconds, ensuring that the outline of the swab

can be seen from the outside of the subject's cheek. Repeat using the opposite side of the foam tip for the other cheek. Remove applicator from the subject's mouth.

The next step is to transfer the cells taken from the inside of the cheek onto the pink sample area of the FTA card. When cells and saliva make contact with the card, the pink area will turn white.

Lift the paper cover of the FTA to expose the pink sample area.

Press the applicator tip within the sample circle area. Without lifting the tip from the card, squeeze the tip by pressing it against the card using a side to side motion three times to completely saturate the sample area. Turn the applicator over and repeat with the other side of the foam tip within the same circle.

The sample area should turn white upon transfer of sample.

Each swab can only be used once and then must be discarded. Discard the applicator and gloves. Do not place the foam swab in the mouth after it has touched the FTA card.

Position the FTA card for drying by supporting the sample area with the paper cover. Allow the card to dry for at least 10 minutes at room temperature if possible.

Seal sides with evidence tape, place in an outer paper envelope, seal with tape. Place your initials over the seal, and transport to the laboratory. If the sample is to be stored, keep in a cool dry environment. Do not store the sample in plastic as it may degrade.

Alternative: EasyCollect – An all in one unit containing the FTA card and the foam applicator swab. Directions are included with the unit.

Buccal swab collection using sterile swabs:

Alternatively, sterile cotton swabs may be purchased at a medical supply facility. Swabs are a more economical alternative; however, they do not contain any preservative, and cannot be used for arrestee samples.

Items you will need for sample collection using sterile swabs:

Swabs

Gloves

Evidence tape

Outer packaging envelope

Sterile swabs should be individually packaged in singles or pairs. Opening a large package of swabs will render them unsterile.

Remove two swabs from the packaging.

Holding the handles of a pair of swabs, place the swabs in the mouth and rub the swabs using a twisting motion for 10 seconds on the inside of the cheek, ensuring that the impression of the swab can be seen from the outside of the subject's cheek. Repeat using the same swabs with the inside of the other cheek.

Place swabs handle side down back into their original packaging and allow to air dry completely.

Place dried swabs and packaging into an appropriate paper transport container, preferably an evidence collection envelope. Seal with evidence tape and place your initials over the seal, and transport to the laboratory. If the sample is to be stored for a short length of time, keep in a cool, dry environment. For long term storage, freezing is recommended.

Remember, proper labeling and packaging are critical to the integrity of this evidence. Please call the Forensic Biology Laboratory at the Department of Health if you have any questions.

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Blood (only if buccal sample cannot be collected)

1. Collect one purple top tube of blood (approximately 5 ml) preserved with EDTA
2. Label the tube with the full name of the person whose blood was collected, the name or initials of the collector and date/time of collection
3. Blood tubes should be placed in a secondary container and refrigerated after collection but must not be frozen. Samples should be delivered to the laboratory as early after collection as possible.

* Knowledge of a blood transfusion or bone marrow transplant should be relayed to the FB Unit prior to the collection of a known blood sample. It may be necessary to wait 90 to 120 days before collecting the known blood.

Packaging of Biological Evidence

Evidence Type	Recommended Packaging
DNA and serological	paper, paper bags, envelopes, cardboard boxes
Blood scrapings and dried stains	enclosed in folded paper packets
Sexual assault evidence	Sexual Assault Evidence Collection Kit provided by CFS

- Plastic containers/bags and airtight containers should not be used to package biological evidence.
- Evidence packages should be maintained in cool, dry locations because heat, sunlight and moisture have destructive effects on biological evidence.
- Each item of evidence should be packaged separately whenever possible, particularly if items are from different sources (i.e. victim and suspect). Handling of evidence should be minimized.
- All evidence items must be thoroughly dried without heat or sunlight before packaging. Items with multiple wet stains should be laid flat to dry to prevent cross-contamination between stains. Drying methods should be chosen that minimize the potential for loss or contamination.

1. Sexual Assault Cases

- SAECK and underpants are tested first; if positive for semen, no further items will be tested
- If SAECK and underpants are negative, then we may test up to three (3) additional items, if appropriate
- No more than five (5) items will be examined for a particular case
- If DNA testing is requested you must provide the known reference sample from the victim and suspect, if available. If a SAECK was taken at the hospital, the victim's reference sample should already be in the SAECK.
- Known reference sample from a recent (within 96 hours) consensual partner must be submitted prior to CODIS entry
- Drug Facilitated Sexual Assault cases require a grey top tube of blood, urine (10 mL each) and the "Sexual Assault Toxicology Testing Consent Form."

2. Criminal Paternity

- Known reference samples must be submitted from the mother/victim, alleged father/suspect and child before any testing will be started.
- Products of conception can also be tested, provided they are stored in a saline solution and not a formalin type solution. We will still need the known reference samples from the mother/victim and the alleged father/suspect.

3. Homicides and other violent crimes

- Up to five (5) items will be examined.
- Only submit the most probative five (5) items.
- If DNA testing is requested you must provide the known reference samples from the victim and suspect, if available
- We can obtain the reference sample for a decedent from the Medical Examiner's Office if an autopsy was performed

- e. Evidence collected at autopsy (i.e. swabs, fingernails, SAECK's etc.) will be returned to the investigating police department upon completion of the case

4. Property Crimes

- a. Up to two (2) items will be examined
- b. Only submit the most probative two (2) items
- c. Should be a body fluid, touch DNA samples are not recommended
- d. Elimination samples from the owner must be submitted with the evidence (Example: Tools that belong to owner used in B&E, normal driver/operator of a stolen vehicle). Elimination samples would NOT be put into CODIS.

Note: If you believe a particular case warrants more items being submitted and examined, you may consult with the unit supervisor and/or case manager. Special arrangements may be allowed based on the circumstances of the case. Do not bring in extra items without prior approval.

Cara Lupino, DNA Supervisor

401-222-5535

Toxicology

The Forensic Toxicology (FT) Unit examines biological and physical specimens for the presence of alcohol, drugs, and poisons. Support is provided to the Center for the Office of the State Medical Examiner and law enforcement agencies investigating crimes where drug or alcohol use may be implicated.

Post-Mortem Toxicology

The purpose of performing post-mortem toxicological testing is to assist the Office of the State Medical Examiner in determining the cause and manner of death. Examples of cause of death include drowning, motor vehicle accident, asphyxia, electrocution, IV drug abuse, overdose, poisoning, aneurysm, gunshot wound, stabbing, seizure, and pulmonary embolism. Manner of death explains whether the death was an accident, homicide, suicide, or natural. In some cases, the manner of death may be undetermined. Types of bodily samples typically submitted include blood, urine, vitreous humor, bile, stomach contents, and liver.

Human Performance Testing

Human-performance toxicology is used to detect the presence or absence of ethanol and other drugs in blood and to evaluate their role in modifying performance or behavior. The FT Unit provides human performance testing services to state and local law enforcement agencies for investigations related to motor vehicle offenses or drug facilitated crimes.

1. Driving under the influence (DUI/DUID): The FT Lab receives blood samples of individuals suspected of operating a motor vehicle while under the influence of ethanol (DUI) or drugs (DUID). Blood samples are tested for the presence of volatiles/ethanol followed by an immunoassay screen for classes of drugs. Should a positive result be obtained from the screening procedure, an appropriate confirmation procedure is performed to identify the analyte of interest. If the blood ethanol concentration is below 0.08% and the immunoassay panel negative, a general drug extraction method is performed to identify any other drugs that may be present. Please note that unlike alcohol, statutory limits do not exist for drugs and therefore any drugs findings are reported as a qualitative result, ex. "Present" or "Not Present". Blood specimen collection kits for use in DUI/DUID cases are available at the FT Lab.

2. Drug-facilitated crimes: The FT Lab also performs analysis of blood and urine samples from suspects or victims relating to investigations of drug-facilitated crimes, such as sexual assault (DFSA). For DFSA cases, it is recommended that both blood and urine samples be collected for analysis. DFSA cases are submitted to the FT Lab by a Forensic Biology staff member. Cases involving drug-facilitated crimes are submitted directly to the FT Lab by the law enforcement agency.

Unknown Liquid/Beverage Analysis

Analysis of unknown liquids and beverages is performed to determine alcohol content or proof. These samples may be submitted by the Office of the State Medical Examiner or law enforcement agencies. Examples include suspicious liquids found in proximity to a decedent, beverages confiscated from establishments suspected of serving alcoholic beverages to minors, or open containers found in vehicles. An alcoholic beverage is defined as any beverage containing greater than or equal to 0.05% ethanol. An intoxicating beverage is defined as any beverage containing greater than or equal to 3.2% ethanol. Leakproof plastic tubes for specimen transport and submittal are available in the FT Lab.

Testing Protocol

Volatiles/Alcohol Analysis

The FT Unit performs volatiles/alcohol testing using headspace gas chromatography (HSGC). This technique is used to identify and quantify levels of volatiles/alcohols present in biological specimens including acetone, methanol, ethanol, and isopropanol. Results are confirmed by a second test or alternate specimen.

Drug Analysis

The FT Lab performs a two-part general procedure to detect the presence of drugs in a sample. A preliminary immunoassay screening technique (ELISA) is used to identify fifteen (15) classes of drugs. The panel includes tests for acetaminophen, amphetamine, barbiturates, benzodiazepines, buprenorphine (Suboxone), cannabinoids (THC), carisoprodol (Soma), cocaines, ethanol, fentanyl, methadone, methamphetamine, opiates, oxycodone, salicylates, tricyclic antidepressants, and zolpidem (Ambien). This testing is followed by confirmatory testing to identify and quantify specific drugs present. Confirmatory techniques include gas chromatography/mass spectrometry (GC/MS), high-performance liquid chromatography (HPLC), and liquid chromatography-tandem mass spectrometry (LC/MS/MS). For death investigations, toxicological analyses will be performed on two fluids if possible, typically blood and urine, to identify and quantify substances present in the body to determine if they may have caused or contributed to the death.

Poisons

Toxicological testing may include testing for poisons. The most frequently found poison is carbon monoxide. Typical cases in which elevated levels of carbon monoxide are found include motor vehicle fatalities, fire deaths, suicides from automobile exhaust, and accidental deaths from improperly vented/operating engines or heating systems. Carbon monoxide levels in blood are measured by spectrophotometry.

Another poison of interest is cyanide, which is commonly used in the manufacturing of textiles and jewelry. Cyanide gas is also released as a result of incomplete combustion of a variety of materials. The FT Unit performs qualitative cyanide testing using a micro-diffusion color reaction. Cyanide confirmations, along with other rarely seen poisons such as strychnine and arsenic, are transferred to the RIDOH Biomonitoring and Chemical Threats Lab for quantification.

Specimens suspected to contain unusual or rarely encountered drugs, volatiles, or poisons may be subcontracted to a reference laboratory for identification and quantification.

Collection, Packaging and Submission of Toxicological Evidence

Toxicology samples should be collected and submitted to FSL as soon as possible after the offense or death.

- Blood tubes should be refrigerated, not frozen, until they are submitted to the laboratory. Do not expose specimens to high temperatures.
- Due to biological hazards, specimens should be packaged in well-sealed, leakproof containers.
- Post-mortem specimens should be collected prior to the embalming process. Law enforcement evidence relating to a medical examiner case must be submitted to the Office of the State Medical Examiner.

	Sample Type	What to Submit
Post-Mortem	Blood (heart and peripheral)	<ul style="list-style-type: none"> • 2 gray top tubes (10 ml each) • 2 red top tubes (1 serum separator) • 1 lavender top tube
	Urine	3 red top tubes (10 ml each)
	Vitreous Humor	1 10 ml red top tube (at least 2 ml)
	Bile	1 10 ml red top tube (at least 2 ml)
	Gastric Contents	1 large plastic container sealed well
	Kidney/Liver/Spleen	1 large plastic container sealed well (~ 10 g) unembalmed if possible
	Lung Tissue	At least 1g in a sealed glass vial w/ crimp top
Law Enforcement*	Blood	2- 10 ml gray stoppered tubes
	Urine (for DFSA cases only)	1 plastic jar containing 30 ml
	Liquids (volatiles analysis)	Plastic screw-top tubes, well-sealed or original containers, at least 10 ml

* Law enforcement personnel should refer to the RIDOH Laboratories [Rules and Regulations](#) regarding the collection and chemical testing of blood and urine samples.

Samples submitted by the Center for the Office of the State Medical Examiner are retained for one (1) year before being returned to this agency.

Samples that are submitted by police departments for the purpose of blood alcohol determination and alcohol content will be destroyed after six (6) months unless a request is made by the submitting agency to hold the samples. Specimens relating to DFSA cases are returned to the Forensic Biology Lab after completion of testing.

Blood specimen collection kits are recommended for DUID cases and are available for pickup in Evidence Receiving or the Toxicology laboratory.

Drug Chemistry

The Forensic Chemistry (FC) Unit is responsible for identifying controlled substances, performing drug assays and investigating product tampering. Laboratory testing includes analysis of pills, powders, potions, drug residues, drug paraphernalia, edibles, and botanicals for the presence of scheduled substances in violation of Federal or Rhode Island General Laws.

The FC Unit provides service to more than 50 law enforcement agencies including state, municipal, campus and airport police. In addition, the FC Unit also serves national and federal agencies such as the Drug Enforcement Agency (DEA), Federal Bureau of Investigation (FBI), US Postal Inspection Service (USPIS), US Secret Service, the Bureau of Alcohol, Tobacco and Firearms (ATF) and the US Marshall.

Submission data by year is available upon request.

Submission of Evidence

NOTE: These are recommended guidelines only and are not meant to be an all-inclusive Standard Operating Procedure.

1. Evidence Submission

- a. Drugs are accepted in Evidence Receiving Monday-Friday, 8:30-12pm. If there is an unusual situation where a submission needs to occur outside of this time frame, an appointment is necessary.
- b. For unusually large items, i.e., bales of marijuana, please make an appointment.
- c. Any wet plant material (such as marijuana plants, leaves, mushrooms, etc.) must be dried before submitting. Allow the material to air dry before packaging and transporting to the lab. Trapped moisture will cause the evidence to rot and be unsuitable for analytical testing.

2. Marijuana (cannabis)

- a. We no longer accept marijuana cases carrying a charge of simple misdemeanor possession when a civil offense or a disposition has been entered.
- b. For simple misdemeanor possessions that do not yet have a disposition, do not submit to the laboratory until they are marked for trial. Under these circumstances, the laboratory will be able to complete the case within two weeks for prosecution.
- c. Live plants need to be dried and sampled before collection.

3. Pills, Powders, Other unknown substances

- a. The item suspected as having the highest penalty in the Schedule would be worked first. It is preferable to determine an identity by physical (visual) means on additional items, rather than a chemical identification.
- b. For substances that do not fit into the categories mentioned above, please consult with the Unit Supervisor before submitting to the lab.

4. Other

- a. For drug paraphernalia, prior approval must be received before submitting to the lab.
- b. Sharps are defined by OSHA as “any contaminated object that can penetrate the skin, including, but not limited to, needles, scalpels, broken glass, broken capillary tubes and exposed ends of dental wires.” Sharps must be submitted in puncture proof containers. Syringes are not accepted; however, the contents of the syringe can be submitted when transferred to a vial. Please contact the Drug Chemistry laboratory to request a vial if needed. Consult with the Unit Supervisor.
- c. Field test kits and razor blades should not be included as part of the evidence submission.
- d. Intact vape pens are not accepted; however, the liquid-containing cartridges are suitable for submission.

Drug Analysis

The FC Unit conducts analytical testing on forensic samples using Gas Chromatography (GC)/ Mass Spectrometry (MS) and Fourier-Transform Infrared Spectroscopy (FTIR).

The FC Unit can fulfill requests for cocaine base analysis for those cases referred to federal court. Juvenile and other cases are expedited upon request.

To identify cannabis (marijuana), the FC Unit uses the standard three-test method involving microscopic examination, thin layer chromatography, and a color test referred to as Duquenois (with a Levine modification).

Breath Analysis

The Forensic Breath Analysis Unit of CFS maintains the State of Rhode Island's breath testing and National Highway Traffic Safety Administration's Standardized Field Sobriety Testing (SFST) program. This program is responsible for the testing of breath alcohol content in suspected intoxicated and impaired motorists and the training of law enforcement personnel in the techniques of Standardized Field Sobriety Testing. The unit instructs over 60 formal classes each year to law enforcement personnel as well as being called upon by prosecutors and defense for in service continuing education classes.

Forensic Breath Testing in Rhode Island utilizes Infrared Absorption for evidentiary chemical testing. Preliminary testing of breath samples utilizes electro chemical fuel cell technology.

The main functions of the Breath Analysis Unit are to:

- monitor, calibrate and inspect breath testing instruments, both preliminary and evidentiary
- certify RI law enforcement officers as breath testing instrument operators
- train law enforcement officers in the areas of instrument operation, relevant laws and regulations and operational protocols
- coordinate the State's SFST instructional program

- The Breath Analysis Unit trains approximately 2000 police officers yearly and performs approximately 900 calibrations/inspections annually on breath testing instruments. They are called upon several times per month to provide testimony in all RI courts in Forensic Breath sampling.

Working closely with Law Enforcement, they facilitate the State's impaired operation program. Any inquiries (discovery or questions) can be directed to the Breath Analysis office.

*_Law enforcement personnel should refer to the RIDOH Laboratories <https://rules.sos.ri.gov/organizations/chapter/216-60> regarding the chemical testing of breath samples.

Subcontracting

It may be necessary for CFS to subcontract work due to unforeseen circumstances, case backlog, need for further expertise or on a continual basis. CFS will select competent forensic testing laboratories that accredited to ISO 17025 standards and meet the general purchasing/contract requirements of the State of Rhode Island. A submitting agency may request a different subcontract laboratory be utilized; however, CFS cannot be responsible for the subcontractor's work. If a submitting agency does not wish CFS to subcontract evidence, the agency should notify the laboratory in advance or indicate this on the "Evidence Examination Request and Receipt" form presented at the time the evidence is submitted. Results from testing performed by a subcontracted laboratory will be clearly identified as such.