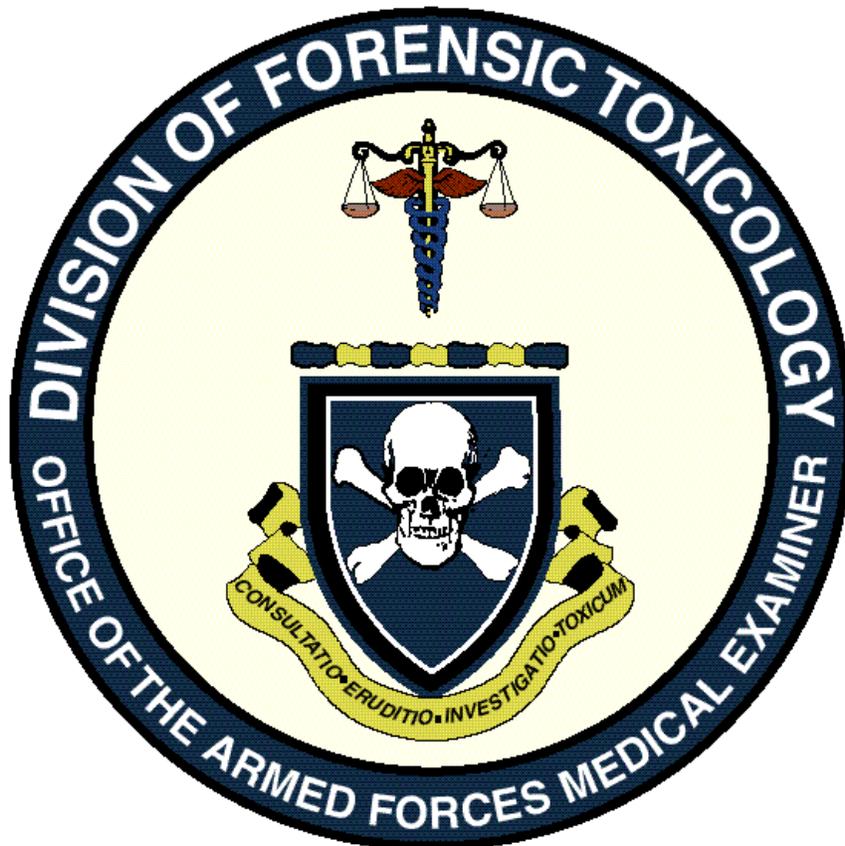


DIVISION OF FORENSIC TOXICOLOGY

*OFFICE OF THE ARMED FORCES
MEDICAL EXAMINER*

ARMED FORCES INSTITUTE OF PATHOLOGY



***GUIDELINES FOR THE COLLECTION
AND SHIPMENT OF SPECIMENS FOR
TOXICOLOGICAL ANALYSIS***

**MICHAEL L. SMITH, Ph.D., D.A.B.F.T.
COL, MS, USA**

**Chief Deputy Medical Examiner
Forensic Toxicology**

**Commercial: (301) 319-0100; DSN: 285-0100
Toll-Free: (800) 944-7912, Option # 4
Fax: (301) 319-0628 or DSN 285-0628
e-mail: FORTOX@AFIP.OSD.MIL**

World Wide Web*: <http://www.afip.org/oafme/tox/tox.html>

*reflects change

March 1, 1999

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I. MISSION

The Division of Forensic Toxicology (DFT), Office of the Armed Forces Medical Examiner (OAFME), Armed Forces Institute of Pathology (AFIP), located at the AFIP Annex, Rockville, MD, remains the DoD's centralized laboratory which performs routine toxicological examinations on Class A, B, and C military aircraft, ground, and ship (sea) mishaps in which *no* fatalities occur (hereinafter referred to as incidents); OAFME cases to include all military aircraft, ground, and ship (sea) accidents involving fatalities; selected military autopsies; biological specimens from AFOSI, CID, and NCIS criminal investigations; blood for legal alcohol and drug tests in DUI and DWI medicolegal determinations; blood and urine in fitness-for-duty interrogations; and, selected forensic cases of national interest.

II. NON-FATALITY CASES (Aircraft ,Ground, & Ship Incidents):

A. COLLECTION:

The following specimens should be collected and submitted:

BLOOD:	7 - 14 mL (NaF; [gray top] tubes)
	7 - 14 mL (EDTA; [purple top] tubes)
	5 - 10 mL (Clot; [red top])* spun or unspun tubes)
URINE:	50 - 70 mL (no preservative)

****DO NOT use SST / CORVAC/ Tiger Top tubes*** for blood collection; the serum- separating gel has been shown to absorb certain classes of drugs. Hand-mix the blood tubes after collection and forward all specimens to our laboratory after properly labeling each tube or container with the name and SSAN of the individual. You are not required to retain any samples at your facility unless your protocol requires it. Send all urine collected; do not delay the entire shipment if the urine container(s) and/ or blood tube(s) are less than the optimal amounts.

B. PACKAGING & SHIPMENT:

Each specimen should be individually wrapped in an absorbent packing material and then placed in a heat-sealed or zip-lock plastic bag; blood and urine should be packaged separately. Next, place all specimens and paperwork (paperwork should also be sealed in a separate plastic bag) from a single individual in another heat sealed or zip-lock plastic bag; do not package different types of specimens together nor package more than one set of patient specimens in each bag. The blood and/or urine should be packed, ***unfrozen***, in a shipping container of sturdy cardboard, plastic or metal construction, sealed, and then sent by the fastest means possible to the AFIP, such as FedEx®, U.S. Priority Mail, or U.S. Second-Day Mail. ***DO NOT*** send package(s) by Registered, Certified, Air Freight, or "Return Receipt Requested" as this will cause significant delays in the delivery of the specimens. Each individual's set of specimens submitted ***must*** have an accompanying AFIP Form 1323 (see *Attachment 1*) and any other documentation pertinent to the case (paperwork should be sealed in a plastic bag). Note that failure to submit a properly completed AFIP Form 1323 will delay processing, may result in an incomplete analysis of the submitted specimens, and may cause test results to be returned to the wrong address.

III. FATALITY CASES (Aircraft, Ground, Ship, & Routine Autopsies):

A. COLLECTION:

In order for the Division to furnish accurate and meaningful toxicological analyses, it is strongly recommended that the following fluid and tissue samples be submitted for testing:

Blood:	All available up to 100 mL (indicate source)
Urine:	100 mL (no preservative)
Bile:	All available
Vitreous:	All available
Liver:	100 grams
Brain:	100 - 200 grams
Kidney:	50 grams
Lung:	50 grams
Gastric:	50 grams

- 1) For victims who survive and later expire during a hospital stay, it can be extremely beneficial if the contributor can furnish any antemortem samples (often stored in a clinical laboratory's refrigerator) along with the postmortem samples. Clearly label the source of all samples (e.g., heart blood or peripheral blood) and clearly differentiate antemortem from postmortem specimens. In addition, list the date and time when the specimens were collected.
- 2) Prompt collection of specimens is essential so they may be protected from contamination and degradation. The remains should be refrigerated as soon as possible. ***NO ONE***, under any circumstances, should attempt collection of blood, urine, or bile by needle puncture if an autopsy is to be performed. Such attempts may result in unsuitable toxicology specimens and cause contamination of crucial evidence such as body wounds, markings, and other prominent features.
- 3) Excellent specimens can easily be obtained at autopsy. The pathologist should select the toxicology samples during examination of the remains and have his or her assistant(s) prepare containers or tubes beforehand. For accidents involving fragmentation of two or more bodies, the flight surgeon and/or pathologist must ensure that the fragments are properly identified before being submitted as specific individuals. If this cannot be guaranteed, specimens must be labeled as commingled remains.
- 4) If no fluids or organs can be recovered, 100 grams of muscle (psoas, perispinal, or deep thigh preferred), and/or fat and red bone marrow can be submitted. In severe crush injuries, the gallbladder will often remain intact, permitting bile collection. Remember that even in the most severely burned or fragmented cases, valuable information can often be obtained from only a few grams of dried blood or tissue (esp. spleen). If in doubt, submit as much tissue as is practical; ***do not submit formalin-fixed tissue for toxicological analysis***. All specimens must be labeled with the sample type, decedent's name, and SSAN (if known). A properly completed AFIP Form 1323 (see *Attachment 1*) ***must*** be submitted with each fatality or OAFME case (including any other documentation pertinent to the case).

B. PACKAGING & PRESERVATION:

Each specimen must be individually packaged and (preferably) heat sealed in a sturdy polyethylene bag (see *Table 1* for NSN supplies). **Plastic containers and cellophane-laminated plastic bags must not be used** for frozen specimens, as they will become brittle, crack, and break when frozen on dry ice.

Fluids should be placed in tightly closed, screw-cap, polyethylene containers and must be labeled with the contents, decedent's name, and SSAN. Indelible felt tipped pens are very useful for this purpose. Care must be taken to avoid contamination of the specimens with solvents that may be found in some inks, formalin-fixed tissue, alcohol, disinfectants, or deodorants. Make sure each tissue is individually packaged, since drug distribution studies of different organs often provide critical information concerning drug use and potential toxicity. Chemical fixatives, such as formalin, embalming fluids, etc., cause interference with toxicological analyses; **do not submit formalin-fixed tissue for toxicological analysis.**

FREEZING with dry ice is the method of choice for preserving tissue. Note that ***glass tubes will often shatter upon thawing when frozen on dry ice*** and paper and tape labels will not stick under the same conditions; it is imperative that each specimen and its accompanying paperwork are all *individually* packaged to prevent contamination upon thawing.

C. SHIPMENT:

All specimen containers should be wrapped with sufficient absorbent material to contain any leakage and then placed in another polyethylene plastic bag and again heat sealed. The AFIP Form 1323 and any other pertinent paperwork should be placed in a separate, sealed plastic bag and placed inside the box (along with the samples) and not included with other shipping documents that may be affixed to the outside of the mailing box. A third, large polyethylene bag should be used to keep all specimens and forms from one individual together.

The frozen tissue(s) and body fluid(s) must then be packed in an insulated shipping container large enough to hold the specimens plus a quantity of dry ice approximately **3 times** the weight of the specimens. When using dry ice, do not use containers in which CO₂ gas is not permitted to escape; gas pressure within a sealed container presents a hazard and could cause the container to burst! **Dry ice must not be placed in a thermos bottle.** Do not use glass containers for packaging or allow fluid containers to come in direct contact with the dry ice, as they will crack. Rather, place tissue containers closest to the dry ice and isolate glass tubes (if used) by encasing them in a separate plastic container *away* from the dry ice.

The shipment **MUST** be sent via an express mail service. Although Saturday and Sunday delivery is acceptable, it is preferred that packages *arrive* Monday through Friday. This is the only rapid means available to ensure that frozen specimens arrive at the AFIP as quickly as is necessary to prevent decomposition.

*******DO NOT MAIL ANY PARCELS TO OUR ROCKVILLE, MD ADDRESS*******

A courier service has been implemented to transport your packages from the AFIP main building (Washington, DC) to our location in Rockville, MD.

We cannot overemphasize the need to pack the specimens with the utmost of care in sturdy containers that are properly labeled and with the correct paperwork. Doing so will protect the integrity of the samples and safeguard all individuals who deliver, open, and process your mail.

IV. INVESTIGATIVE CASES

A. DEFINITION:

The following types of cases may be submitted to the Division for toxicological analysis; they will be classified as “investigative”:

- 1) *criminal investigations* (AFOSI, CID, & NCIS agencies)
- 2) *legal BAT's* (BAC's) from DUI/ DWI incidents
- 3) *fitness-for-duty testing*

Analyses routinely performed for these cases include: *volatiles* (ethanol, methanol, etc.) and *drugs of abuse* (complete drug screen available upon request; if known, drug in question should be disclosed). **WE DO NOT TEST FOR THE PRESENCE OF STEROIDS.** Please call us beforehand should questions arise.

B. COLLECTION:

The following specimens should be collected and submitted:

BLOOD: 14 - 21 mL (NaF; [*gray* top] tubes)
URINE: 50 - 70 mL (no preservative)

After collection, hand-mix the blood tubes and label all specimens with the name and SSAN of the individual.

C. PACKAGING & SHIPMENT:

Each specimen should be individually wrapped in an absorbent packing material and then placed in a heat sealed or zip-lock plastic bag; blood and urine should be packaged separately. Next, place all specimens and paperwork (paperwork should also be sealed in a separate plastic bag) from a single individual in another heat sealed or zip-lock plastic bag; do not package different types of specimens together nor package more than one set of patient specimens in each bag. The blood and/or urine should be packed, ***unfrozen***, in a shipping container of sturdy cardboard, plastic or metal construction, sealed, and then sent by the fastest means possible to the AFIP, such as FedEx®, U.S. Priority Mail, or U.S. Second-Day Mail. ***DO NOT*** send package(s) by Registered, Certified, Air Freight, or "Return Receipt Requested" as this will cause significant delays in the delivery of the specimens. Each individual's set of specimens submitted ***must*** have an accompanying AFIP Form 1323 (see *Attachment 1*) and any other documentation pertinent to the case (paperwork should be sealed in a plastic bag). Note that failure to submit a properly completed AFIP Form 1323 will delay processing, may result in an incomplete analysis of the submitted specimens, and may cause test results to be returned to the wrong address.

V. MAILING ADDRESS:

Though our laboratory has moved, please continue to use the following address for all submissions. **YOU MUST LABEL** the outside of the package with (2) phrases: “*Clinical/ Diagnostic Specimens Enclosed*” and “*Shipment complies with U.S. domestic and IATA international packaging regulations.*” It is also important that the word “Biohazard” **DOES NOT** appear anywhere on the outside wrapping of the package. Refer to the Domestic Mail Manual Sections CO23.8.4 through CO23.8.10 for complete instructions.

Armed Forces Institute of Pathology
Attn: Division of Forensic Toxicology
Building 54
6825 16th Street, NW
Washington, DC 20306-6000

VI. COMMUNICATION:

Division of Forensic Toxicology (AFIP-Annex, Rockville, MD) Voice and VoiceMail:

Forensic Toxicology (Comm & DSN).....(301) 319-0100 or 285-0100 (DSN)
Forensic Toxicology (Toll-Free).....(800) 944-7912, Option # 4

AFIP Main Building (Washington, DC) Voice:

AFIP Information (24 hrs.).....(202) 782-2100 or 662-2100 (DSN)
AFIP Case Search (Center for Adv Path).....(800) 774-8427
AFIP Receiving & Accessions (RRR).....(202) 782-1630 or 662-1630 (DSN)

Facsimile (FAX):

Forensic Toxicology.....(301) 319-0628 or 285-0628 (DSN)

E-Mail: FORTOX@AFIP.OSD.MIL

World Wide Web (WWW) address* to view and print electronic version of this SOP, or obtain fillable Adobe Acrobat or Delrina Formflow versions of AFIP FORM 1323: (*changed)

<http://www.afip.org/oafme/tox/tox.html>

VII. PAPERWORK:

NEW AND IMPROVED! A single-sided AFIP Form 1323, rev. FEB 99, AFIP/ Division of Forensic Toxicology - Toxicological Request Form has been developed to replace the outdated version created in 1960. Significant improvements including larger demographic boxes, clearer subject areas, and an updated chain-of-custody section should make completing one easier than ever. The form is also downloadable from the Web in both printable and fillable formats. *Submitting triple copies of the AFIP Form 1323 is no longer required*; complete and submit one form for each person (see *Attachment 2 sample*), including any other applicable forms relative to the case. The paperwork should be placed and sealed in a separate polyethylene bag. All available information [a brief history of the events surrounding the incident, crash, death, etc.; pertinent drug history; scene description; condition of the body(ies) when recovered; and/ or autopsy report] should also be submitted with the specimens. These historical data and array of applicable facts can assist the toxicologist in selecting special procedures to supplement routine analysis. Paperwork should be carefully printed or typed. Again, we cannot overemphasize the importance of establishing chain-of-custody documentation with a properly completed AFIP Form 1323 form. Correctly completed paperwork must be submitted with each case or significant delays will occur.

VIII. HELPFUL HINTS/ ADDITIONAL INFORMATION:

1. **Do not mix submissions** for other departments (e.g., slides, x-rays, tissue blocks, fixed tissue, etc.) with toxicology specimens. These samples should be forwarded (with appropriate paperwork) to the respective department or to the AFIP’s Receiving and Accessions Branch (under separate cover) at:
 Armed Forces Institute of Pathology
 Attn: Receiving & Accessions/ RRR
 Bldg. 54, Room G071
 6825 16th Street, NW
 Washington DC 20306-6000
2. When packaging shipments **do not seal tubes or containers** with wax, parafilm or masking/ scotch-tape. Routine UA sample cups (with yellow or blue lids) generally leak during shipment and are *not* recommended; rather, use a urine container that is sturdy (one that has a metal or hard-plastic *screw-top* lid) such as NSN Stock # 6640-00-165-5778. Evidence tape is not required, but is acceptable. Absorbent Pouches, such as NSN 6530-01-304-9754, will contain most spills and meet US and international mail requirements.
3. The POC (Point-of-Contact) for the submitted case should include their printed name, telephone number, FAX number, and an e-mail address (if applicable) to facilitate communication concerning “problem” cases in the appropriate box on the new AFIP Form 1323.
4. **It is *not* necessary** to provide advanced telephonic notice or a VoiceMail message that specimens are being shipped to us for toxicological analysis.
5. Lastly, please call for information or clarification concerning collection and shipment policies if you are unsure of what to do. It is better to temporarily delay shipment of specimens than to send specimens improperly collected, labeled, packaged, and shipped or to submit cases without the correct paperwork.

REFERENCES:

TM 8-300, NAVMED P-5065 & AFM 160-19

Mail Regulations: AR 40-57 (OAFME); IATA, Section 3.6.7 and Packing Instruction 650; *Domestic Mail Manual*, Section CO23.8.4 through CO23.8.10

Table 1: Bag, Polyethylene, Flat, Heat-Seal Closure (for Shipping):

8105-00-680-0503	4” x 6”
8105-00-702-7177	5” x 12”
8105-00-702-7178	18” x 48”
8105-00-299-8532	20” x 40”
8105-00-200-0195	24” x 24”