

**STANDING OPERATING PROCEDURE FOR OBTAINING, HANDLING AND
SHIPMENT OF BIOMEDICAL SAMPLES**

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IMPORTANT

THIS DOCUMENT WILL BE PERIODICALLY UPDATED, PLEASE ROUTINELY CONSULT THIS PAGE OR INSTITUTE PERSONNEL FOR THE MOST CURRENT PROCEDURES

Assay techniques for detection of chemical warfare agents in biomedical samples are described in [TB MED 296](#). The purpose of this document is to provide information on procedures for obtaining, handling and shipment of biomedical samples for analysis as described in [TB MED 296](#) at the US Army Medical Research Institute of Chemical Defense (USAMRICD). Note that analytical methodologies utilized for sample analysis are for forensic investigational purposes only. They are not FDA approved clinical procedures and are not intended to provide the physician with information to implement or modify treatment. The procedures apply only to the detection of chemical agents in biomedical fluids.

For analyses of occupational health or environmental samples (soil, water, air, wipe, vegetation, etc.) for contaminants such as toxic metals, volatile & semi-volatile organic compounds, asbestos, explosives, pesticides/PCB, etc., contact the US Army Center for Health Promotion and Preventive Medicine (USACHPPM), Directorate of Laboratory Sciences (DLS) <http://chppm-www.apgea.army.mil/dls/custsvc.asp>. All sample submissions should be coordinate with DLS. The CHPPM-DLS **does not** analyze samples containing chemical warfare agents (surety agents), infectious agents, or toxins. Therefore, all samples from areas suspected of being contaminated with agent must be screened for suspect materials and certified as agent-free (in writing) before being submitted to CHPPM-DLS for further analysis.

Those samples for analysis of **radioactive** elements must meet all license and shipping requirements. For samples with elevated concentrations of radioactive elements, the Radiation Protection Officers assigned to both the sending and receiving (CHPPM) organizations must be involved before samples are sent.

For information on samples containing infectious/biological agents contact US Army Medical Research Institute of Infectious Diseases - homepage info www.usamriid.army.mil primary contact phone number 301-619-2772. For off-duty hours, the Staff Duty Officer pager number is 301-631-4338.

For information on public health concerns regarding chemical agent exposure contact The Centers for Disease Control and Prevention (CDC). Toll free public inquiry lines 888 246-2675 (English)
888 246-2857 (Spanish)

866 874-2646 (hearing disabled)
or e-mail
cdcresponse@ashastd.org

I. Nerve Agents

A. Samples to be Collected:

1. **Blood Sample: Mandatory** – The analysis of acetylcholinesterase activity in blood is the primary method utilized to screen for possible exposure to nerve agents. Blood should be obtained according to procedures outlined in [Blood Sample Collection](#).
 - a. [Minimum Volume](#)
 - b. [Anticoagulant](#)
 - c. [Shipping Method](#)
 - d. [Ship To](#)
 - e. [Documents to be Included with Package](#)
 - 1) [Incident Report Form](#)
 - 2) [Form DD1911 – Chain of Custody](#)
 - f. [Special Considerations](#)
 - g. [Sample Analysis: Turn-Around Time](#)
2. **Urine Sample: Optional** – The collection of urine is optional for detecting the presence of hydrolysis compounds to nerve agents. The analysis of urine samples would be utilized for definitive identification of the parent agent following a suspected exposure. Urine should be obtained according to procedures outlined in [Urine Sample Collection](#).

II. Sulfur Mustard, Lewisite

A. Samples to be Collected:

1. **Urine Sample: Mandatory** – Urine is the primary sample needed to confirm sulfur mustard or lewisite exposure. Urine should be obtained according to procedures outlined in [Urine Sample Collection](#).

- a. [Minimum Volume](#)
- b. [Shipping Method](#)
- c. [Ship To](#)
- d. [Documents to be Included with Package](#)
 - 1) [Incident Report Form](#)
 - 2) [Form DD1911 – Chain of Custody](#)
- e. [Special Considerations](#)
- f. [Sample Analysis: Turn-Around Time](#)

2. **Blood Sample: Optional** – Blood samples for sulfur mustard are optional. See [Blood Sample Collection](#).

III. Cyanide

A. Samples to be Collected:

1. **Blood Sample: Mandatory** – Blood should be obtained according to procedures outlined in [Blood Sample Collection](#).

IV. Collection of Samples: The collection of all biomedical samples should be done under close supervision of a qualified health care provider or physician to prevent contamination, tampering or mislabeling. A tamper-proof strip should be placed across the container and clearly marked/identified with the patient's name, social security number, and date with the patient's initials. A chain-of-custody form should be initiated at the time the samples are generated.

A. Biomedical Sample Collection Kit: A list of items necessary for collection of samples can be found [here](#). Most materials are readily available from medical units. If materials cannot be obtained, [contact MRICD](#) and a [Biomedical Sample Collection Kit](#) can be shipped. NOTE: Shipment can only be made to authorized Military Health Care Providers.

B. Blood Sample Collection: It is recommended that the samples be cautiously handled from the start of the collection to maintain integrity and preclude the possibility of contamination, tampering or mislabeling. All samples should be collected under the close supervision of a health care provider/physician and if possible witnessed by an unbiased observer. Samples should be obtained as soon as possible following the suspected exposure. A second blood sample drawn 30-60 days later may be necessary if inhibition of cholinesterase activity is determined in the initial samples.

1. **Minimum Volume:** At least 2 milliliters (ml) of blood are required for analysis.
2. **Anticoagulant:** Blood should be drawn into Vacutainers (purple top tubes) containing ethylenediaminetetraacetic acid (EDTA) as an anticoagulant.
3. **Shipping Method:** Blood samples should be kept refrigerated (not frozen) and shipped with adequate ice packs to maintain samples as cold as possible without freezing. If immediate shipping is not possible, the blood sample should be stored refrigerated.
4. **Documents to be Included with the Package:**
 - a. **Incident Report Form**
 - b. **Form DD1911 - Chain of Custody**
5. **Special Considerations:** A second blood sample drawn 30-60 days later may be necessary if inhibition of cholinesterase activity is determined in the initial samples.
6. **Sample Analysis:** [Turn-Around Time](#)

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C. Urine Sample Collection: Urine samples should be taken to confirm suspected exposure to sulfur mustard and lewisite and is optional for nerve agent exposure. The collection of urine samples should be done under the close supervision of a health care provider or an unbiased observer to preclude the possibility of sample tampering. Care should be taken to ensure appropriate handling so as to minimize chances for contamination from the environment or handling personnel. The urine should be collected immediately following suspected exposure or at the earliest possible time. If possible, follow-up samples should be obtained at 24 hours and 7 days. Also provide a control urine sample from an individual known to be unexposed. Urine should be collected in clean urine cups. Immediately transfer 10 – 30 milliliters (ml) of the urine to a plastic sample tube/container.

1. **Minimum Volume:** At least 10 – 30 ml of urine is required.
2. **Shipping Method:** All urine samples should be shipped with dry ice in order that they remain frozen.
3. **Documents to be Included with the Package:** Incident Report Form; Form DD1911 - Chain of Custody
4. **Special Considerations:** Permit enough air space in the container to allow for sample expansion during freezing. Sample containers made of non-

breakable plastic, which can withstand cryogenic temperatures, should be used during shipping.

5. Sample Analysis: [Turn-Around Time](#)

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V. Shipping of Samples: Approval must be obtained prior to shipment of samples. Authorization can be obtained by phone or email as described in the [contact information](#). All urine samples in sealed containers should be shipped in dry ice in order that they remain frozen. Blood should be shipped with ice packs and be maintained as cold as possible without freezing. If immediate shipping is not possible, samples of urine should be stored frozen and blood refrigerated. Shipment should be made as expeditiously as possible to maintain temperature control of the samples.

A. Ship to:

COMMANDER
US Army Medical Research Institute of Chemical Defense
ATTN: MCMR-UV-PA/Analytical Chemistry
3100 Ricketts Point Road, Aberdeen Proving Ground, MD 21010-5400.

B. Contact Information:

Duty Hours: 0730-1630 Monday - Friday
Phone: 410-436-4254 or 410-436-2173
Email: mricdbiosamples@APG.AMEDD.ARMY.MIL

Off Duty Hours: Staff Duty Officer (SDO) cell phone 410-322-6822 or pager 800-759-8888 (PIN 1308825)

C. Documents to be Included with the Shipping Package:

- 1. Incident Report Form:** Select [here](#) for an Incident Report Form. Enclose in the shipping package, documentation describing information on the time of suspected exposure, onset time and description of symptoms, sample collection time, potential agents involved, patient age and gender as well as names, addresses, and phone numbers of persons to contact.
- 2. Form [DD1911](#), Material Courier Receipt:** The Form [DD1911](#) is a chain of custody form that should be initiated at the sample collection point and accompany the samples. An example of how to fill out the DD1911 can be found [here](#).

VI. Sample Analysis: Turn-Around Time

TEST	SAMPLE	TURN-AROUND TIME
Cholinesterase Inhibition (AChE, BuChE)	Blood	24-48 hours
Nerve Agent Hydrolysis Products (GB, GD, GF)	Urine ¹ , Blood (optional)	72 hours
Sulfur Mustard (thiodiglycol)	Urine ¹	72 hours

¹ Urine samples are the primary specimen needed for the Nerve Agent Hydrolysis Product and Sulfur Mustard (thiodiglycol) assays.