

**BY ORDER OF THE COMMANDER
910TH AIRLIFT WING**

**910TH AIRLIFT WING INSTRUCTION
48-153**



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Aerospace Medicine

**MEDICAL SURVEILLANCE OF
ASSIGNED AERIAL SPRAY
PERSONNEL**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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OPR: 910 MDS/SGP

Certified by: 910 AW/CC
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This instruction assigns responsibilities and defines medical testing requirements for 910th Airlift Wing personnel assigned to the Aerial Spray mission. It implements requirements outlined in AFI 48-145, *Occupational and Environmental Health Program*, and interfaces with AFI 32-1074, *Aerial Application of Pesticides*, and AFI 48-102, *Medical Entomology Program*. Occupational health information collected in conjunction with this surveillance will be managed according to AFMAN 48-146, *Occupational Health Information Management*.

SUMMARY OF CHANGES

This revision updates the frequency of required medical surveillance for 910 AW personnel assigned to the Aerial Spray mission to more accurately align with actual risk of pesticide exposure. It eliminates annual cholinesterase testing and instead requires baseline testing new members and post-mission testing as needed based on exposure potential of individual members, such as the Spray Maintenance group (910 MXS/MXMX). This publication applies to all Air Force (AF) active duty personnel, civilian employees, Air Force Reserve Command (AFRC) Units and the Air National Guard (ANG) for 910 AW personnel assigned to the Aerial Spray Mission. Send comments and suggested improvements on AF Form 847, *Recommendation for Change of Publication*, through channels, to Lt Col Mark Breidenbaugh (757AS/DOS). This instruction requires the collection and or maintenance of information protected by the Privacy Act of 1974 authorized by 10 U.S.C., Section 8013, *Power and Duties of the Secretary of the Air*

Force, 10 U.S.C., Chapter 55, *Medical and Dental Care*, Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees*, and Executive Order 9397 as amended by Executive Order 13478, *Amendments to Executive Order 9397 Relating to Federal Agency Use of Social Security Numbers*. The applicable SORN F044 AF SG E Medical Record System is available at: <http://dpclo.defense.gov/Privacy/SORNs.aspx>. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System.

1. General.

1.1. Application of pesticides from large aircraft permits rapid coverage of large areas and treatment of areas inaccessible to ground-control equipment. The 910 AW Aerial Spray Mission members use certified personal protective equipment and operate equipment that under normal working conditions does not result in an overexposure to pesticides. During extended aerial spray deployments (30+ days) members' consistent handling and use increasing the potential for low level exposure and, consequently, medical surveillance of these personnel may be required. Therefore, after being assigned to the Aerial Spray Mission, members will complete baseline bloodwork prior to working with certain pesticides described below. This baseline will be used in the event that future testing is needed, such as during contingency operations, to ensure that asymptomatic exposure is quickly recognized and medically managed.

1.2. Hazard description: Organophosphate pesticides are routinely used by the Aerial Spray Mission for mosquito control applications. The mode of action of these substances is the inhibition of the enzyme cholinesterase. Human toxicity from various organophosphate pesticides can vary widely. Nearly all are readily absorbed from dermal contact, inhalation, and ingestion, making it essential for medical personnel to evaluate work conditions and practices to assess possible exposure hazards. Such evaluations have shown the 910 AW are not exposed to OPs when the correct personal protective equipment and proper handling techniques are used.

1.3. Target organs and potential health effects: The major target organs for organophosphate pesticides are part of the peripheral and central nervous system. Severe acute symptoms of overexposure include, but are not limited to, excessive bronchial secretions, salivation, respiratory distress, incontinence, pinpoint pupils, fasciculation, abdominal cramps, tremors, cyanosis, and coma. Chronic low-level exposure may cause similar neurologic effects that are more subtle in nature and appear over time.

1.4. The majority of 910 AW Aerial Spray missions using OPs are of three (3) to five (5) days in duration and use OPs 1-3 nights during this timeframe. In most cases, aircrew members will not participate in another mission for weeks or months. Therefore, 910 AW aircrew are not at risk for chronic low-level exposures during normal mission execution. During an emergency response, the 910 AW may deploy the aerial spray mission, under these conditions, aircrews may be spraying OPs several nights a week. Consequently, when the Aerial Spray Mission deployment results in the application or handling of OP pesticides for thirty (30) hours or more over a thirty (30) day period monitoring of members may become necessary.

2. Objectives.

- 2.1. Ensure 910 AW personnel assigned to the Aerial Spray mission are aware of the requirements for baseline cholinesterase testing.
- 2.2. Define the responsibilities for 910th Medical Squadron (910 MDS) personnel to ensure follow-on testing is conducted as needed.
- 2.3. Standardize documentation of medical surveillance to facilitate trending of data.
- 2.4. Formalize periodic review of medical surveillance data to identify wing-wide trends.

3. Responsibilities.

3.1. 910 AW squadron commanders.

3.1.1. Identify personnel assigned to the Aerial Spray Mission who may be at risk for possible pesticide exposure: Aerial Spray duties, the handling of cholinesterase-inhibiting products on the ground, or duties performed by aircrew personnel who will be flying onboard military aircraft during Aerial Spray missions where cholinesterase-inhibiting products are being dispensed from the aircraft, unless air sampling has shown no risk is present.

3.1.2. Ensure notification to 910 MDS/SGP and 910 MSG/SGPB of newly assigned Aerial Spray personnel so that individuals are entered into the medical surveillance program prior to performing duties involving organophosphate pesticides.

3.1.3. Ensure assigned personnel report to the 910 MDS for testing upon assignment to Aerial Spray, after any acute exposure, and after handling (i.e. loading) cholinesterase-inhibiting pesticides for greater than 30 hours within a 30 day period. Operating the closed spray system will not be considered time spent handling the pesticides.

3.1.4. Remove personnel from Aerial Spray operations or associated activities if indicated by results of medical surveillance testing or after any acute exposure.

3.1.5. Notify 910 MDS/SGP and 910 MSG/SGPB of Aerial Spray personnel who leave or are removed from the program so they can be scheduled for a termination occupational health exam, if appropriate.

3.2. 910 MDS/CC.

3.2.1. Provides on-going medical guidance to the 910 AW and supported units regarding health risks associated with the Aerial Spray mission.

3.2.2. Supports medical surveillance through equitable resourcing and staffing within the 910 MDS.

3.3. 910 MDS/SGP.

3.3.1. Executes medical surveillance of Aerial Spray personnel as part of the Wing Occupational Health Program (OHP).

3.3.2. Assigns a physician to serve as the Installation Occupational and Environmental Medicine Consultant (IOEMC) with knowledge of the Aerial Spray Mission.

3.3.3. Ensures the IOEMC has received training regarding the Aerial Spray mission and its associated medical risk.

3.3.4. Ensures that discussion of the Aerial Spray program is a standard agenda item for the Occupational and Environmental Health Working Group (OEHWG).

3.3.5. Encourages participation in the OEHWG from other base agencies involved in the Aerial Spray mission and its risk, such as base/wing Safety Office (SE) and base/wing Civil Engineering (CE), and to include an aerial spray medical entomologist (757 AS/DOS).

3.3.6. Elevates medical concerns and adverse trends regarding Aerial Spray personnel to the 910 MDS commander for resolution.

3.4. 910 MSG/SGPB.

3.4.1. Ensures Occupational and Environmental Health exposure and risk assessments are accomplished IAW AFMAN 48-146 *Occupational & Environmental Health Program Management*.

3.4.2. Assigns risk level categorization and presents to Occupational & Environmental Health Working Group (OEHWG) for review. Completes routine (qualitative) surveillance according to frequency requirements. Provides special (quantitative) surveillance of finding from risk assessment. Ensures Department of Defense Occupational & Environmental Health Readiness System – Industrial Hygiene (DOEHRs-IH) is used to manage OEH program data.

3.4.3. Notifies Air Force (AF) members (civilian and military) with potential for exposure to organophosphate pesticides of the associated risks and the methods to effectively minimize the possibility of exposure.

3.4.4. Assists workplace supervisors with information on regulatory compliance requirements associated with pesticide use.

3.4.5. Assists element commanders and supervisors in development of Risk Management measures in order to facilitate their incorporation of Occupational Risk Management (ORM) into their operations.

3.4.6. Investigates possible occupational illnesses identified by Aerial Spray personnel.

3.5. 910 MDS/SGPM.

3.5.1. Ensures Public Health (SGPM) representation in the OEHWG.

3.5.2. Monitors and provides feedback to the OEHWG on the reporting and investigation of suspected occupational illnesses or incidents with Aerial Spray personnel. Initiates, manages and coordinates completion of AFSAS Occupational Illness and Injury Investigations, ensuring closure within AFSAS prescribed time frames.

3.5.3. Performs trending of occupational illness outcomes and presents trending data to the OEHWG and ESOHC.

3.5.4. Collaborates with 910 MSG/SGPB to prepare and provide information addressing recognition, prevention, and health effects of occupational exposures and meets all regulatory requirements.

3.6. 910 MDS Physical Exams and Standards.

3.6.1. Performs Occupational Health Examination (OHE) scheduling, reporting, and follow-up according to section 6 of this publication.

3.6.2. Manages occupational health information according to AFMAN 48-146, *Occupational Health Information Management*.

3.7. 910 AW Occupational Health Working Group (OHWG).

3.7.1. Implements and executes the local occupational health program under the direction of the 910 MDS/CC.

3.7.2. Reviews recommendations from 910 MDS/SGPB and 910 MDS/SGPM regarding medical surveillance activities of Aerial Spray personnel.

3.7.3. Reviews trends in possible occupational illnesses of Aerial Spray personnel.

3.7.4. Notifies supervisors and commanders of adverse trends, including occupational health occurrences (OHO) (i.e., illness rates, adverse reproductive outcomes, etc.) incidence, no show, exam completion rates, compliance trends, and compensation claims and awards.

3.7.5. Discusses training shortfalls, including adverse occurrences that may represent training deficiencies, and develop effective strategies to address them.

4. Surveillance Program Description.

4.1. Routine Surveillance: Routine surveillance is the process by which 910 MSG/SGPB personnel periodically assess activities and identify potential health risks, identify data required to characterize the health risks, identify additional evaluations needed to obtain that required data, identify occupational health program costs, identify processes in which more current technology may be applicable, and ensure compliance with occupational health program and regulatory requirements.

4.2. Special Surveillance: Special surveillance is the process in which 910 MSG/SGPB personnel further characterize health risk preferably through specific quantitative monitoring such as air sampling and cholinesterase testing. The results of the additional monitoring are interpreted by comparison with established health standards.

5. Workplace Categorization and Surveillance Frequency.

5.1. 910 MDS/SGPB personnel will visit and reassess each worksite at least annually. If adverse trends are noted, OEHWG may request more frequent visits until all problems are corrected.

6. Types of Medical Surveillance Examinations (MSE) required for Aerial Spray personnel.

6.1. Baseline MSE.

6.1.1. MSE examinations are performed before placement in an Aerial Spray position with a possible pesticide exposure in order to assess (from a medical standpoint) if the member will be able to perform duties capably and safely, to determine if the member meets any established physical standards, and to obtain baseline cholinesterase measurements for future comparison.

6.1.2. At no time will any person who has not completed the baseline cholinesterase test be authorized to perform any Aerial Spray duties involving an organophosphate pesticide.

6.1.3. Cholinesterase testing will be done once and analyzed at the same laboratory utilized for all baseline and surveillance testing. All baseline tests should be taken when the member has had no exposure to organophosphate pesticides for at least thirty (30) days. **NOTE:** The normal range for serum and Red Blood Cell (RBC) cholinesterase determinations is wide, with marked individual variability, laboratory variability, and variability of different analytical methods. For this reason, baseline pre-exposure measurements taken by the same methodology and by the same laboratory are extremely important.

6.2. Post-Exposure MSE.

6.2.1. MSEs are accomplished to identify early changes in health status and may include laboratory monitoring to detect evidence of organophosphate poisoning in personnel who have experienced an incident of acute exposure or have been handling organophosphates for 30 or more hours within a period of 30 days.

6.2.2. Post-exposure MSEs should be completed within 24 hours of the acute exposure or the member will be assigned duties other than those associated with OPs.

7. MSE Scheduling, Reporting, and Follow-Up Process.

7.1. The MSE scheduling, reporting, and follow-up process is performed by the 910 MDS Physical Exams and Standards section.

7.2. Completion and no-show/cancellation rates for clinical surveillance shall be tracked and all MSE results will be maintained in the medical record of the tested member.

7.3. MSE results will be communicated to the member and to the OEHWG.

8. Processing of Cholinesterase Blood Samples.

8.1. 910 MDS personnel will draw the required blood samples, package samples, and ensure timely shipment to the designated laboratory for analysis. Samples remain stable for four (4) hours without refrigeration and seven (7) days if refrigerated.

8.2. The designated testing laboratory must be a state-certified laboratory with the capability to perform the following cholinesterase tests: (1) Pesticide; or, (2) Red Blood Cell (RBC), and plasma (serum) levels. Samples must be processed within seven (7) days of collection. If the designated testing laboratory is changed, a new baseline must be established for all assigned personnel to account for variability in testing methods.

9. Review and Documentation of Cholinesterase Testing.

9.1. 910 MDS/SGP personnel will review all cholinesterase test results and direct follow-up if required.

9.2. A drop in plasma or RBC cholinesterase levels to eighty (80) percent of a member's baseline or lower, indicates the need for retesting.

9.2.1. Any follow-up testing required must be conducted by the same laboratory, using consistent analytical methodology to ensure accurate identification of trends.

9.2.2. If a persistent drop in the cholinesterase level is confirmed, 910 MDS personnel will (1) notify the worksite supervisor of the finding; and (2) investigate the workplace for possible faulty work practices and recommend corrective action(s) in collaboration with 910 MSG/SGPB.

9.2.3. A drop in RBC cholinesterase level to 70 percent of baseline or lower, or a drop in plasma cholinesterase level to 60 percent of baseline or lower, indicates a need for immediate removal of the member from all exposure to cholinesterase inhibitors until both parameters return to within 80 percent of the pre-exposure baseline or higher. NOTE: A reduction in serum cholinesterase activity to 60 percent of baseline may occur before any symptoms appear, and a drop to 20 percent of baseline activity is required before serious neuromuscular symptoms become apparent.

9.3. All cholinesterase results (and recommendations for any required follow-up) will be initialed by a qualified medical provider prior to being entered into the member's medical record.

10. Post-Acute Exposure Evaluation, Attachment 2.

10.1. Upon completion of any aerial spray mission where an acute exposure to OPs occurred, all exposed and potentially exposed personnel must complete the Cholinesterase Monitoring Follow-Up Form (Attachment #2). This will be returned to the Aerial Spray Mission Commander and delivered to 910 MDS/SGA through unit command channels.

10.2. 910 MDS/SGA office, through coordination with the 910 MDS Installation Occupational Consultant, will review the form for a follow-up MSE as might be appropriate. The completed form plus any remarks or medical instructions will become part of the member's medical history record. Data will be coordinated with the 910 MDS Bioenvironmental Engineering office, the 910 AW Aerial Spray Entomologist, the 910 AW Flight Surgeon, and Pesticide Program Manager.

JOSEPH D. JANIK, Colonel, USAF
Commander, 910th Airlift Wing

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 32-1074, *Aerial Application of Pesticides*, 7 November 2014

AFI 48-102, *Medical Entomology Program*, 9 September 2019

AFI 48-145, *Occupational and Environmental Health Program*, 11 July 2018

AFMAN 33-363, *Management of Records*, 1 March 2008

AFMAN 48-146, *Occupational Health Information Management*, 15 October 2018

MEDICAL SUPERVISION OF PESTICIDE WORKERS, *Guidelines for Physicians Who Supervises Workers Exposed to Cholinesterase Inhibiting Pesticides, Edition 6.0*, December 2017

Abbreviations and Acronyms

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFSAS—Air Force Safety Automated System

AFSC—Air Force Skill Code

AW—(910) Airlift Wing

CC—Commander

CES—(910) Civil Engineering Squadron

COHER—Clinical Occupational Health Exam Requirements

EIN—Electronic Identification Number

ESOHC—Environmental Safety and Occupational Health

IOEMC—Installation Occupational and Environmental Medicine Consultant

MDS—(910) Medical Squadron

MSE—Medical Surveillance Exam

MSG—Mission Support Group

OEHWG—Occupational and Environmental Health Working Group

OHO—Occupational Health Occurrence

OHP—Occupational Health Program

ORM—Occupational Risk Management

PA—(Federal and Military) Privacy Act

PCS—Permanent Change of Station

RBC—Red Blood Cell

SE—(910) Safety Office

SGA—Administrator

SGP—Chief of Aerospace Medicine

SGPB—Bioenvironmental Engineering

SGPM—Public Health

SSN—Social Security Number

Attachment 2

CHOLINESTERASE MONITORING ACUTE EXPOSURE FOLLOW-UP FORM

Interview: Post-Mission, Pesticide Exposure, Use one form per person.

NOTICE: When data is provided below, this form/questionnaire becomes **FOR OFFICIAL USE ONLY (FOUO)**, and must be protected. Do NOT display or show EIN or SSN data.

Last Name, First, Middle Initial	Unit/Organization	AFSC	Date

Provide a response to the following questions:

1. Have you experienced any health effect or symptoms that you believe are related to pesticide exposure any time during your participation in Aerial Spray activities? Select **YES** or **NO**.

2. Describe the health effects or symptoms:

3. Have you experienced any of the following during this Aerial Spray mission?

	Yes	No	Rarely	2	3	4	Often
Muscle twitch or weakness							
Shortness of breath							
Diarrhea							
Frequent urination							
Headaches							
Dizziness / Vertigo							
Nausea or Queasiness							
Stomach pain							
Unexplained anxiety							
Pinpoint pupils							
Tunnel vision							
Excessive sweating							
Excessive tearing							
Drooling							

Comments:

(If YES to any item, IMMEDIATELY refer to Flight Surgeon/Pesticide Program manager)

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