

**BY ORDER OF THE COMMANDER
59TH MEDICAL WING**

**59TH MEDICAL WING INSTRUCTION
48-106**



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Aerospace Medicine

MEDICAL LASER SAFETY PROGRAM

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This instruction implements the Defense Health Agency-Administrative Instruction (DHA-AI) 087, *Radiation Safety Program and Radiation Safety Committee* and the DHA-AI 108, *Non-Ionizing Radiation Safety*. This medical wing instruction (MDWI) establishes the responsibilities and outlines the procedures for implementation of a Medical Laser Safety Program (MLSP). The goal of the MLSP is to ensure operational safety for the medical lasers used within the 59th Medical Wing (MDW). This instruction applies to all assigned, attached, or detailed Active Duty or Reserve members, federal civilians, and other personnel assigned temporary or permanent duties within 59 MDW facilities. Refer recommended changes and questions about this publication to the Office of Primary Responsibility using the AF Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Changes include: Updated references, oversight authority for the 59th Medical Wing Commander, Medical Laser Safety Officer (MLSO), Wing Safety, Bioenvironmental Engineering (BE) Flight/Installation Laser Safety Officer (ILSO), Clinical Engineering/Biomedical Equipment Technicians (BMET), Service Chief (SC), and Service Medical Laser Supervisor (SMLS) are listed. Training recommendations for the Laser Safety Officer and maintenance and service technicians are updated. Individually created laser standard operating procedures may be

replaced or supplemented by the manufacturer's written hazard and safety, operating, maintenance, and calibration procedures combined with this 59 MDWI 48-106. BMET is required to obtain maintenance instructions from the manufacturer of each laser.

1. Responsibilities.

1.1. 59th Medical Wing Commander (59 MDW/CC).

1.1.1. Responsible for establishing and maintaining a program that ensures compliance with the American National Standards Institute (ANSI) Z136.3-2018, *Safe Use of Lasers in Health Care*, and Air Force Instruction (AFI) 48-139, *Laser and Optical Radiation Protection Program*, and DHA-AI 087, *Radiation Safety Program and Radiation Safety Committee*.

1.1.2. Ensures medical personnel operate under conditions specified in applicable regulations, authorizations, applications, and correspondences and comply with instructions concerning the safe receipt, possession, distribution, use, transportation, transfer, and disposal of Class 3B or 4 lasers and non-iodizing radio frequency sources in accordance with DoD Instruction 6055.15 and DoD Instruction 6055.11.

1.1.3. Appoints a Medical Laser Safety Officer and Alternate, in writing in consultation with the Radiation Safety Officer (RSO) to coordinate the program for the wing.

1.1.3.1. The MLSO and alternate MLSO should be trained to a level commensurate with their duties. MLSOs require a minimum of a 10-hour course but certification as a MLSO through the National Council on Laser Certification is recommended.

1.1.3.2. The MLSO may be the RSO, Safety Officer, or other qualified individual.

1.1.4. Appoints a Radio Frequency Safety Officer in writing in coordination and consultation with the site RSO and provides a copy to the site RSO by April 30 annually if there is any change.

1.1.5. Coordinates all questions or reports concerning non-ionizing radiation with the DHA Radiation Safety Committee.

1.2. Medical Laser Safety Officer.

1.2.1. Implements and conducts a medical laser safety program as required by this instruction, DHA-AI 108, ANSI Z136.3-2018, and AFI 48-139. Works closely with the Bioenvironmental Engineering Flights/Installation Laser Safety Officers, Wing Safety, and BMET to oversee the program.

1.2.2. Suspends, restricts, or terminates the operation of a laser system if deemed that laser hazard controls are inadequate.

1.2.3. Updates this instruction and the 59 MDW Peri-Operative Laser Safety Checklist as needed to reflect changes to applicable standards.

1.2.4. Maintains the Medical Laser Safety SharePoint website (https://clinical.sammc-eis.lackland.af.mil/medical_laser_safety/default.aspx) to ensure the availability of the documents required by the Service Medical Laser Supervisors (SMLS) to implement their department's Laser Safety Program.

1.2.5. Maintains an inventory of all ANSI Class 3 lasers and above within the 59 MDW. Coordinates with SMLS, BE, and Clinical Engineering/BMET to update the inventory list annually. Provides a copy of the inventory to the RSO and Wing/CC by May 31 each calendar year as per DHA-AI 108.

1.2.6. Works with the SMLS to ensure the 59 MDWI 48-106 is reviewed yearly and available in all departments with ANSI Class 3B and 4 medical lasers.

1.2.7. Performs a semi-annual safety assessment of each department that uses medical lasers to ensure compliance with applicable standards. Documentation will be tracked on the Medical Laser Safety SharePoint website and a paper copy maintained in the Wing Laser Safety Binder.

1.2.8. Reports results of the safety assessments to Occupational Medicine who communicates with the Occupational and Environmental Health Working Group.

1.2.9. Requests an internal or external survey at least once every 3 years for compliance with non-ionizing radiation safety guidance and regulations. Provides written copies of the surveys to the DHA RSO and site RSO.

1.2.10. Conducts quarterly meetings of the 59 MDW Laser Safety Committee (LSC) to ensure compliance with local procedures and regulations to include:

1.2.10.1. Serves as the approving body for new medical laser procurements, oversees laser department semi-annual safety assessments and wing safety surveys, and mitigates laser safety issues.

1.2.10.2. Responsible for notifying the DoD Laser Systems Safety Working Group Joint Services Evaluation Subgroup and the RSO of any laser system being considered for procurement or development.

1.2.10.3. At a minimum, the committee shall consist of the RSO, MLSO and/or alternate MLSO, occupational health physician, industrial hygiene officer or environmental hygiene officer, an ophthalmologist, dermatologist, public health, and safety program manager, and a representative from each department that utilizes class 3B or 4 lasers.

1.2.10.4. Annually the LSC will review the entire laser safety program.

1.2.10.5. The LSC provides reports to the site RSO who is responsible to report to the DHA RSO and 59 MDW/CC.

1.3. BE/ILSO.

1.3.1. Conducts laser health hazard evaluations IAW AFI 48-139. Evaluations are to be performed by BE/ILSO IAW AFI 48-139 prior to first use, or as needed. Equipment changes or other modifications may require a new evaluation.

1.3.2. Works closely with Facilities Management in the planning of new structures that will house medical lasers to ensure safety controls are implemented into the design.

1.3.3. Recommends engineering, administrative, and procedural controls as necessary to the appropriate commander.

1.3.4. Maintains records of surveys, reports, calculations, and control measures imposed for each laser and laser system.

1.3.5. Reports and evaluates suspected unintended exposures and prepares required reports for submission IAW 48-139 and DoD Instruction 6055.15.

1.3.6. Coordinates reports and evaluations with occupational medicine, public health, and safety.

1.4. Wing Safety.

1.4.1. Reviews and recommends policies and procedures to prevent mishaps from associated non-radiation laser hazards as defined in appropriate safety plans and directives.

1.4.2. Periodically evaluates procedures and inspects facilities to ensure compliance with safety requirements. Results should be relayed to the 59 MDW LSC and the Service Medical Laser Supervisor (SMLS).

1.4.3. Investigates incidents related to laser ancillary safety hazards, such as electrocution, shock, etc., per AFI 91-204, *Safety Investigations and Reports* and AFI 48-139.

1.4.4. Verifies laser safety is included in the Job Safety Training Guide for the Group and Flight Safety Officers.

1.5. BMET.

1.5.1. Obtains written service, calibration and schedule of maintenance instructions from the manufacturer for each laser IAW ANSI 136.3 paragraph 4.2.2.

1.5.2. Requires engineering and administrative controls to be in place prior to commencement of operations or maintenance for all Class 3B and 4 medical lasers. Specific instructions on control measures can be found in ANSI Z136.3, paragraphs 4.1-8, and AFI 48-139, Chapter 3.

1.5.3. Maintenance and service of Class 3B and Class 4 Lasers shall be performed only by technicians certified in laser service by the manufacturer or having other specific qualification for medical devices. All aspects of maintenance and service of lasers shall follow the requirement of this standard IAW ANSI 136.3 paragraph 4.2.2.

1.5.4. Performs inspection and testing, if required by manufacturer guidelines, of work center's personal protective equipment (PPE) annually by May 31st of each calendar year.

1.6. SC of clinical services with medical lasers.

1.6.1. Appoints a SMLS to coordinate the program for the service.

1.6.2. Routes new laser requests through the LSC including information such as such as the manufacturer, model, serial number, class, power, and whether the laser is pulsed versus continuous.

1.6.3. Establishes and maintains controls over areas where laser exposures above the maximum permissible exposure could occur.

1.6.4. Coordinates with the Credentials Department to verify all staff providers operating lasers have completed a training program such as a residency and are licensed and credentialed in the specific requested laser procedures. Trainees and support staff laser operators must have supervision and discuss each patient with a directly available credentialed provider prior to the procedure.

1.7. Service Medical Laser Supervisor.

1.7.1. Acts as the point of contact for the service on medical laser safety matters and is an active liaison with the MLSO, BE/ILSO, BMET, and Wing Safety.

1.7.2. Assists the SC and MLSO in implementing policies, procedures, and/or instructions necessary to meet all applicable laser safety standards from this MDWI, AFIs, The Joint Commission, or other pertinent directives.

1.7.3. Coordinates with and assists the MLSO during their semi-annual safety assessment which includes inspections of personal protective equipment.

1.7.4. Ensures the 59 MDW Peri-Operative Laser Safety Checklist is co-located with the laser and readily available. Educates laser operators on the need to review the checklist prior to each procedure and document completion of the checklist in each patient's record.

1.7.5. Maintains an inventory of the lasers in the department and reports any changes to the MLSO and ILSO.

1.7.6. Maintains a roster of department personnel with the date of their Baseline Laser Eye Exam for any staff who may be exposed to laser procedures. A repeat examination should be completed upon termination of employment. Verifies the mandatory medical surveillance examination is on the Department Inprocessing and Outprocessing Checklist for all department staff. Verifies the shop supervisor enters the staff member into ASIMS for additional oversight.

1.7.7. Organizes annual training in laser hazards and specific operational and safety procedures commensurate with staff duties. This should include potential laser exposure hazards and appropriate protective measures including personal protective equipment. Ensures documentation of annual laser safety training on personnel's AF Form 55, *Employee Safety and Health Record*.

1.7.8. Ensures any planned changes in laser operations are coordinated with, and if necessary, evaluated by BE and the LSC prior to operational implementation.

1.7.9. Maintains current standard operating procedures specific for each individual laser are kept with each laser as per paragraph 2.3 of this instruction.

1.7.10. Ensures the SC is immediately notified of any laser incidents to include injury to the patient and/or medical personnel. Incidents will be reported to the unit commander, MLSO, BE/ILSO, RSO, and Wing Safety. Appropriate medical treatment will be sought immediately.

1.7.10.1. Calls the Tri-Service Laser Injury Hotline (1-800-473-3549 or DSN 240-4784) for immediate expert medical advice and submit a report to the Laser Accident

and Injury Registry. 1.7.10.2. Completes a 59 MDW Patient Safety Report for any laser incident.

1.8. Personnel in Clinical Services with Medical Lasers.

1.8.1. All personnel assigned to a service with medical lasers Class 3B or 4 must be trained on laser safety upon initial assignment to the service and annually thereafter. This training shall be documented on each individual's AF Form 55.

1.8.2. All personnel who use medical lasers (Class 3B or 4), assist with procedures using medical lasers, or working in a laser operation environment more than once monthly shall be enrolled in the medical surveillance program and subject to baseline and post-employment eye exams. They will be tracked upon inprocessing via the mandatory department Inprocessing Checklist to each department that offers laser procedures. Laser eye exams are administered at Optometry on the second floor of Wilford Hall Ambulatory Surgical Center (292-2815) and at Reid Medical Clinic Optometry (292-1055) and appointments are scheduled by calling the clinics directly. The exam will be documented on SF Form 600, *Medical Record – Chronological Record of Medical Care*, or equivalent and a letter of completion of the examination provided to the member. Proof of the examination should be provided to the SMLS who will maintain a current roster of the eye examinations. The shop supervisor will enter the staff into ASIMS for tracking.

1.8.3. Reviews the 59 MDW Peri-Operative Laser Safety Checklist before each laser procedure and documents the completion of the checklist in the patient's record.

1.8.4. Inspects PPE before each use. Ensures operational PPE is readily available, removes damaged or improperly working PPE from patient care area. Notifies the SMLS and the department's Equipment Custodian to replace the PPE.

1.8.5. Performs testing, if required by manufacturer guidelines, of work center's personnel protective equipment (PPE) annually by May 31st of each calendar year. Goggles and drapes do not require annual testing which is the primary PPE required for medical lasers.

2. Control Measures.

2.1. Medical Laser Safety Training Requirements.

2.1.1. General laser safety training is required for all personnel assigned to a service with medical lasers Class 3B or 4 IAW ANSI Z136.3, paragraph 5.2.

2.1.2. Training shall be conducted upon initial assignment to a service with refresher training annually. Training is to be documented on AF Form 55 and kept in the CAF.

2.1.3. Training objectives shall ensure that the users are knowledgeable of the potential hazards and control measures specific to each laser and/or procedure to include, but not limited to:

2.1.3.1. Personal Protective Equipment (e.g. goggles, non-flammable drapes).

2.1.3.2. Area warning signs (only displayed when laser is in operation).

2.1.3.3. Laser generated airborne contaminants (e.g. plume control).

- 2.1.3.4. Fire and explosion hazards (e.g. flammable items, endotracheal tube fires, non-flammable packaging, unit-dose applicators for flammable antiseptics, and a preoperative time out to verify the application site is dry prior to draping prior to the use of any lasers)
- 2.1.3.5. Only authorized personnel who have been trained in laser safety to a level commensurate with their participation are allowed in procedure room.
- 2.2. Staff and provider training on the use of a new laser for medical treatment, whether administered by the laser manufacturer representative, Service Chief, or other qualified personnel, shall be conducted and documented prior to initial clinical use.
- 2.3. Standard Operating Policies and Procedures.
 - 2.3.1. Every Class 3B and Class 4 laser must have the manufacturer's written hazard and safety, operating, maintenance, and calibration procedures easily accessible.
 - 2.3.2. Standard operating procedures for each specific medical laser should be kept with the laser and outline the standard safety issues associated with the specific medical laser and protective measures for the operator and patient. It must also contain guidelines for general use and treatment protocols. The Manufacturer's User Guide is the preferred operating procedure guide if available and adequately covers the required information.

3. Laser Incidents.

- 3.1. Any injured or potentially injured patient or medical personnel will receive medical evaluation immediately. Occupational medicine is responsible for coordinating the initial and follow up examinations, and care for suspected overexposures. Following any actual or suspected overexposure to laser radiation, the pertinent examinations as determined by a qualified provider shall be performed IAW AFI 48-139, paragraph 3.6.
 - 3.1.1. Call the Tri-Service Laser Injury Hotline (1-800-473-3549 or DSN 240-4784) for immediate expert medical advice.
 - 3.1.2. The unit commander, SC, SMLS, BE/ILSO, Wing Safety, Public Health, Occupational Medicine, and MLSO will be notified.
 - 3.1.3. Broken and/or malfunctioning devices will be tagged and removed from patient use immediately.
 - 3.1.4. The SMLS will ensure appropriate documentation of any incident in the Patient Safety Reporting System. Completes the AF Form 978, *Supervisor Mishap Report*. If the injured party is a civilian fill out a Form CA-1, *Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation*.
 - 3.1.5. Public Health, in coordination with Occupational Medicine, initiates the investigation in the AFSAS as per AFI 48-139.
 - 3.1.6. Within 3 duty days, the ILSO must report accidents or incidents to the Tri-Service Laser Injury Registry.
 - 3.1.7. Evaluation of the cause(s) of the incident will be conducted by BE/ILSO, Wing Safety, and Public Health with appropriate members within the safety organization and recommendations will be made and instituted for future mishap prevention.

3.1.8. Within 30 workdays, the ILSO must complete an investigation with a separate final report.

DANIEL K FLOOD, Colonel, USAF, MC
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Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFI 48-139, *Laser and Optical Radiation Protection Program*, 30 September 2014

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

AFI 91-204, *Safety Investigations and Hazard Reporting*, 27 April 2018

ANSI Z136-3, *American National Standard for Safe Use of Lasers in Health Care*, 2018DHA-AI 087, *Radiation Safety Program and Radiation Safety Committee*, 1 August 2019

DHA-AI 108, *Non-Ionizing Radiation Safety*, 09 August 2019

DoD Directive 6055.15, *DoD Laser Protection Program*, 04 May 2007

59 MDWI 91-203, *Medical Wing Safety Program*, 6 July 2016

Adopted Forms

AF Form 55, *Employee Safety and Health Record*

AF Form 847, *Recommendation for Change of Publication*

AF Form 978, *Supervisor Mishap Report*

Form CA-1, *Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation*

SF Form 600, *Medical Record – Chronological Record of Medical Care*

Abbreviations and Acronyms

AFI—Air Force Instruction

AFSAS—Air Force Safety Automated System

ANSI—American National Standards Institute

BEE—Bioenvironmental Engineering Flight

BMET—Biomedical Equipment Technicians

DHA-AI—Defense Health Agency Administrative Instruction

IAW—In Accordance With

ILSO—Installation Laser Safety Officer

LSC—Laser Safety Committee

MDW—Medical Wing

MDWI—Medical Wing Instruction

MFR—Memorandum for Record

MLSO—Medical Laser Safety Officer

MLSP—Medical Laser Safety Program

PPE—Personal Protective Equipment

RSO—Radiation Safety Officer

SC—Service Chief

SMLS—Service Medical Laser Supervisor

μm—Micrometers

Attachment 2**LASER CLASSIFICATION****A2.1. Class 1 Laser System:**

A2.1.1. Considered to be incapable of producing damaging radiation levels during operation. It is exempt from any control measures or other forms of surveillance.

A2.2. Class 1M Laser System:

A2.2.1. Considered to be incapable of producing hazardous exposure conditions during normal operation unless the beam is viewed with an optical instrument such as an eye-loupe (diverging beam) or a telescope (collimated beam). It is exempt from any control measures other than to prevent potentially hazardous optically aided viewing; and is exempt from other forms of surveillance.

A2.3. Class 2 Laser System:

A2.3.1. Emits in the visible portion of the spectrum [0.4 to 0.7 micrometers (μm)], and eye protection is normally afforded by the aversion response.

A2.4. Class 2M Laser System:

A2.4.1. Emits in the visible portion of the spectrum (0.4 to 0.7 μm). Eye protection is normally afforded by the aversion response for unaided viewing. However, Class 2M is potentially hazardous if viewed with certain optical aids.

A2.5. Class 3 Laser System:

A2.5.1. May be hazardous under direct and specular reflection viewing conditions, but is normally not a diffuse reflection or fire hazard. There are two subclasses.

A2.6. Class 3R Laser System:

A2.6.1. Potentially hazardous under some direct and specular reflection viewing conditions if the eye is appropriately focused and stable, but the probability of an actual injury is small. This laser will not pose either a fire hazard or diffuse-reflection hazard.

A2.7. Class 3B Laser System:

A2.7.1. May be hazardous under direct and specular reflection viewing conditions, but is normally not a diffuse reflection or fire hazard.

A2.8. Class 4 Laser System:

A2.8.1. Is a hazard to the eye or skin from the direct beam, and may pose a diffuse reflection or fire hazard. It may also produce laser generated air contaminants and hazardous plasma radiation.