

**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 Air Force Policy Directive AFPD 48-1, *Aerospace Medicine Enterprise*. 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 personnel assigned, attached, or on contract to the 59 MDW, with the exception of personnel working at the 359th Medical Group-Joint Base San Antonio-Randolph and the 959th Medical Group. This instruction does not apply to the Air National Guard or Air Force Reserve. 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 in accordance with (IAW) Air Force Manual 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System Records Disposition Schedule.

**SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed. Major changes include: Updated references and added responsibilities to match Accreditation Association for Ambulatory Health Care (AAAHC) standards.

## 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) Z136.3-2011, *Safe Use of Lasers in Health Care*, and Air Force Instruction (AFI) 48-139, *Laser and Optical Radiation Protection Program*.

1.1.2. Appoints a Medical Laser Safety Officer (MLSO) and Alternate to coordinate the program for the wing.

### 1.2. Medical Laser Safety Officer.

1.2.1. Implements and conducts a medical laser safety program as required by this instruction, ANSI Z136.3-2011, and AFI 48-139. Works closely with the Bioenvironmental Engineering (BEE) Flight/Installation Laser Safety Officer (ILSO), Wing Safety, and Clinical Engineering/Biomedical Equipment Technicians (BMET) to oversee the program.

1.2.2. Updates this instruction, the wing laser safety Standard Operating Procedures, and the 59 MDW Peri-Operative Laser Safety Checklist as needed to reflect changes to applicable standards.

1.2.3. Maintains the Medical Laser Safety SharePoint website ([https://clinical.sammceis.lackland.af.mil/medical\\_laser\\_safety/default.aspx](https://clinical.sammceis.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.

1.2.4. Maintains an inventory of all ANSI Class 3 lasers and above within the 59 MDW. Coordinates with SMLS, BEE, and Clinical Engineering/BMET to update the inventory list annually.

1.2.5. Works with the SMLS to ensure Standard Operating Procedures (SOPs) and/or Operating Instructions (OIs) pertaining to medical laser use are created and updated yearly in all clinics with ANSI Class 3B and 4 medical lasers IAW ANSI Z136.3.

1.2.6. Performs a semi-annual (i.e. every six months) audit of each department that uses medical lasers to ensure compliance with applicable standards. The audit is based on 2013 AAAHC Chapter 10, subchapter II standards.

1.2.7. Reports results of the audits to the Executive Committee of the Medical Staff as required.

### 1.3. BEE/ILSO.

1.3.1. Conducts laser health hazard evaluations when notified of new operations, equipment changes, or any modifications that may alter potential personnel hazards IAW AFI 48-139, paragraph 3.3.1.

1.3.2. Determines the laser class, exposure limits, hazard distances, and zones. Recommends engineering, administrative, and procedural controls as necessary to the appropriate commander.

1.3.3. Performs laser hazard evaluations as required by the occupational health special surveillance program in AFI 48-145, *Occupational and Environmental Health Program*.

1.3.4. Reports and evaluates suspected unintended exposures and prepares required reports for submission IAW 48-139.

1.3.4.1. Coordinates reports and evaluations with the occupational physician, public health, and safety.

1.3.4.2. Keeps all necessary laser safety personnel informed of actions being taken or required as part of a medical investigation.

#### 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.

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.

#### 1.5. Service Chiefs (SC) of clinical services (i.e. departments) with medical lasers.

1.5.1. Develops and annually updates the policies, procedures, and/or OIs necessary to meet AAAHC standards, AFI 48-139, and this instruction.

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

1.5.3. Generates a memorandum for record (MFR) for each provider listing the lasers (by medium, e.g. Nd:YAG, CO<sub>2</sub>, etc.) they are trained and competent to use. This MFR shall be forwarded to the Credentials Office.

1.5.4. Ensures completeness of laser permit requests (including contractor-used and/or owned lasers) by submitting information on the manufacturer, model, serial number, class, power, and whether the laser is pulsed versus continuous to the BEE/ILSO IAW 48-139.

#### 1.6. Service Medical Laser Supervisor.

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

1.6.2. Assists the SC in implementing policies, procedures, and/or instructions necessary to meet all applicable laser safety standards from SOPs, manuals, OIs, AFIs, AAAHC, etc.

1.6.3. Coordinates with and assists the MLSO during their semi-annual audit.

1.6.4. Ensures the 59 MDW Peri-Operative Laser Safety Checklist is physically attached to the laser and/or visibly posted in the procedure room and that completion of the checklist is documented in the patient's record.

1.6.5. Maintains an inventory of the lasers in the department.

1.6.6. Maintains a roster of department personnel with the date of their Baseline Laser Eye Exam.

1.6.7. Ensures documentation of annual laser safety training on personnel's AF Form 55, *Employee Safety and Health Record*.

1.6.8. Ensures any planned changes in laser operations are coordinated with, and if necessary, evaluated by BEE prior to operational implementation.

1.6.9. 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 MLSO, BEE/ILSO, and Wing Safety. Appropriate medical treatment will be sought immediately.

#### 1.7. Personnel in Clinical Services with Medical Lasers.

1.7.1. 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 the personnel's AF Form 55.

1.7.2. All personnel who use medical lasers (Class 3B or 4), assist with procedures using medical lasers, or routinely working in a laser operation environment shall be subject to baseline eye exams and post-employment eye exams. Laser eye exams are administered at Occupation Medicine on the 5th Floor of the Wilford Hall Ambulatory Surgical Center. The exam will be documented on SF Form 600, *Medical Record – Chronological Record of Medical Care*, or equivalent.

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

## 2. Control Measures.

### 2.1. Laser Hazard Evaluation.

2.1.1. Evaluations are to be performed by BEE/ILSO IAW 48-139 prior to first use, annually, or as needed. Evaluations will be documented on AF Form 2760, *Laser Hazard Evaluation*, and shall be maintained by BEE/ILSO.

2.1.2. All required engineering and administrative controls shall be in place prior to commencement of operations or maintenance for all Class 3B and 4 medical lasers.

2.1.3. Specific instructions on control measures can be found in ANSI Z136.3, paragraphs 4.1-8, and AFI 48-139, Attachment 3.

### 2.2. New Facilities.

2.2.1. BEE/ILSO shall be consulted in the planning of new structures that will house medical lasers to ensure safety controls are implemented into the design.

### 2.3. Medical Laser Safety Training Requirements.

2.3.1. 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 1.2.1 and Table 1.

2.3.2. Training shall be conducted upon initial assignment to a service with refresher training annually. Training is to be documented on AF Form 55.

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

2.3.3.1. Personal Protective Equipment (e.g. goggles, drapes).

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

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

2.3.3.4. Fire and explosion hazards (e.g. flammable items, endotracheal tube fires).

2.3.4. 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.

#### 2.4. Standard Operating Procedures.

2.4.1. Every Class 3B and Class 4 laser must have a SOP IAW ANSI Z136.3, paragraph 4.2.1. This SOP may be locally generated or from the manufacturer.

2.4.2. The SOP shall outline the standard safety issues associated with the specific medical laser and protective measures for the operator and patient. The SOP will also contain attachments on general use and treatment protocols. These attachments may be copied from the manufacturer's instruction guide and/or from the current medical literature.

### 3. Laser Incidents.

3.1. Any injured or potentially injured party will receive medical evaluation immediately. If medical equipment is damaged or potentially damaged (non-routine types of damage) and/or a patient or medical personnel is injured, the SC, SMLS, BEE/ILSO, Wing Safety, and MLSO will be notified. Other members of the safety organization, such as Occupational Medicine, will be notified as needed.

3.1.1. Broken and/or malfunctioning devices will be tagged and removed from patient use.

3.1.2. 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 3.5.2 and Attachment 4.

3.2. The SMLS will ensure appropriate documentation of any incident in the Patient Safety Reporting System, Form CA-1, *Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation*, AETC Form 435, *Mishap Data Worksheet*, and/or AF Form 457, *USAF Hazard Report*, per standard Occupational Medicine and Safety incident reporting protocols.

3.3. Evaluation of the cause(s) of the incident will be conducted by the SMLS IAW AFI 48-139, Attachment 4 with appropriate members within the safety organization and recommendations will be made and instituted for future mishap prevention.

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Chief of the Medical Staff

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

AFPD 48-1, *Aerospace Medicine Enterprise*, 23 August 2011  
AFI 91-204, *Safety Investigations and Reports*, 24 September 2008  
ANSI Z136-3, *American National Standard for Safe Use of Lasers in Health Care*, 2011  
AFI 48-139, *Laser and Optical Radiation Protection Program*, 25 July 2012  
AFI 48-145, *Occupational and Environmental Health Program*, 15 September, 2011  
59MDWI 91-203, *Medical Wing Safety Program*, 9 February 2009

***Adopted Forms***

AF Form 55, *Employee Safety and Health Record*  
AF Form 457, *USAF Hazard Report*  
AF Form 847, *Recommendation for Change of Publication*  
AF Form 2760, *Laser Hazard Evaluation*  
AETC Form 435, *Mishap Data Worksheet*  
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***

**AAAH**C—Accreditation Association for Ambulatory Health Care  
**AFI**—Air Force Instruction  
**ANSI**—American National Standards Institute  
**BEE**—Bioenvironmental Engineering Flight  
**BMET**—Biomedical Equipment Technicians  
**IAW**—In Accordance With  
**ILSO**—Installation Laser Safety Officer  
**OI**—Operating Instruction  
**MDW**—Medical Wing  
**MDWI**—Medical Wing Instruction  
**MFR**—Memorandum for Record  
**MLSO**—Medical Laser Safety Officer  
**MLSP**—Medical Laser Safety Program

**SC**—Service Chief

**SMLS**—Service Medical Laser Supervisor

**SOP**—Standard Operating Procedure

**Mm**—Micrometers

## Attachment 2

### LASER CLASSIFICATION

**A2.1. Class 1 Laser System:** 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:** 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:** Emits in the visible portion of the spectrum [0.4 to 0.7 micrometers ( $\mu\text{m}$ )], and eye protection is normally afforded by the aversion response.

**A2.4. Class 2M Laser System:** Emits in the visible portion of the spectrum (0.4 to 0.7  $\mu\text{m}$ ). 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:** 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:** 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:** 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:** 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.