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US Army Garrison Command
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*Fort Knox Reg 40-23

Medical Services

LASER RADIATION MEDICAL SURVEILLANCE PROGRAM-MEDDAC, FORT KNOX

Summary. This regulation describes medical surveillance involving personnel who use lasers. Included are personnel involved, responsibilities, and the scope of required examinations.

Applicability. This regulation applies to all commanders, safety officers of units having or using lasers at Fort Knox, and users of laser equipment. Moreover, this regulation applies to the US Army Medical Department Activity (MEDDAC) departments that administer the surveillance program.

Proponent. The proponent of this regulation is the MEDDAC, Fort Knox, KY.

Suggested Improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, MEDDAC (MCXM), Fort Knox, Kentucky 40121-5111.

1. Purpose. This regulation establishes policy and prescribes procedures for the prevention and early recognition of ocular impairment or injury in military and civilian personnel who are exposed to laser radiation or operate laser equipment.

2. References.

- a. FM 8-50, Prevention and Medical Management of Laser Injuries, 8 Aug 90.
- b. Army OTSG policy letter, SGPS-PSP, 11 Apr 94, subject: Vision and Ocular Assessments of Personnel in Laser and Radiofrequency Radiation Environments.
- c. TB MED 524, Control of Hazards to Health from Laser Radiation, 31 Jan 06.
- d. American National Standards Institute (ANSI) Standard Z136.1-2007, 16 Mar 07, subject: American National Standard for Safe Use of Lasers.
- e. DA Pam 385-24, The Army Radiation Safety Program, 24 Aug 07 (with RAR 001, 25 Feb 10).

*This regulation supersedes USAARMC Reg 40-23, 15 February 2001.

f. USACHPPM Bulletin, Laser/Optical Radiation Hazards.

3. General. Laser radiation is a potentially serious health hazard. Adequate protective devices and observance of strict safety procedures will reduce exposure hazards. Aside from acute injury, an individual may not recognize harmful exposure. Cumulative effects from repeated exposure due to laser radiation may be sustained. The most sensitive to damage by laser radiation is the eye structure; therefore, detection and evaluation of hazardous exposure are based on routine eye examinations.

4. Scope. This regulation applies to personnel working in a laser environment (e.g., personnel working with lasers and personnel having a known or suspected overexposure to laser radiation).

5. Responsibilities.

a. Individuals are responsible for reporting to scheduled appointments, following safety procedures, and reporting any suspected overexposures as soon as possible.

b. Activity commanders will ensure all personnel within their organizational element and whose duties or assignments are, as defined in paragraph 4 above, familiar with the provisions of this regulation and comply with the respective requirements.

c. Units (often the unit safety officers) are responsible for maintaining an accurate roster of personnel involved in their surveillance program and contacting the Occupational Health Clinic, MEDDAC, to arrange examinations in a timely manner. Moreover, units are responsible for maintaining their laser equipment inventory, providing a copy to the Installation Radiation Safety Officer (IRSO) annually, and reporting inventory changes to the IRSO as they occur.

d. The IRSO is responsible for ensuring units have a surveillance roster, as outlined in paragraph 5c of this regulation, and maintaining a comprehensive inventory of laser equipment belonging to the installation. The IRSO will maintain a unit surveillance roster.

e. Industrial Hygiene, MEDDAC, is responsible for identifying potentially hazardous lasers at Fort Knox and reporting them to the Occupational Health Clinic, MEDDAC, and affected units.

f. Optometry and Ophthalmology Clinics, MEDDAC, are responsible for performing exams in a timely manner when requested by Occupational Health, MEDDAC; recording results in the medical records; and reporting abnormal or suspicious findings to the Occupational Health Clinic, MEDDAC.

g. Occupational Health Clinic, MEDDAC, performs some vision screenings, assists in referring personnel to Optometry or Ophthalmology, when required, and reports overexposures.

6. Personnel Categories for Vision/Ocular Assessments.

a. The Installation Laser Safety Officer (ILSO) will determine personnel categories for each employee. The ILSO is often the IRSO.

b. Vision/ocular assessments are not required for personnel using Class 1, 2, 2a, and 3a (3R) lasers and laser systems, as defined in ANSI Standard Z136.1-2007 (paragraph 3.3.3.2) of paragraph 2d this regulation. Vision/ocular assessments are required for personnel using Class 3B and 4 lasers and laser systems. The type of medical exam required will be based on the personnel category, as determined by the ILSO.

c. Laser workers are individuals who routinely work in laser environments. Engineering controls, administrative procedures, and/or personal protective equipment ordinarily protect these individuals. Examples of laser workers are research personnel, maintenance/repair personnel, system training personnel, and personnel using lasers for medical treatment.

d. Incidental laser personnel are individuals working in a laser area whose duties make it unlikely they will be overexposed to laser energy sufficient to damage their eyes or skin. Examples of incidental laser personnel include laser custodial personnel, military personnel during field exercises, and clerical or supervisory personnel not working directly with laser devices.

7. Vision/Ocular Assessments for Personnel in Laser Environments.

a. Pre-placement screenings are performed on all laser workers and all incidental laser personnel working with Class 3B and 4 lasers. The purpose of this examination is to determine the baseline visual acuity and ocular health status of the employee. (Laser workers and incidental laser personnel potentially exposed to only Class 1, 1M, 2M, 2, 2A, and 3A (3R) lasers have no vision screening requirement beyond routine screening in their pre-placement physical exam or under other Occupational Health guidelines.) Individuals having abnormal findings will be referred for a diagnostic examination.

b. Diagnostic examinations are performed on individuals who have abnormal ocular findings on their pre-placement or termination vision screening. The purpose of this examination is to determine the cause of abnormal findings. These examinations should be done in a non-urgent but timely manner.

c. Immediate ophthalmic examinations will be administered when there is a known or suspected laser overexposure. The immediate examination will be performed within 24 hours of the overexposure or as soon as possible after the suspected overexposure is reported. In the event of a reporting delay, this examination should be performed even if a significant period of time has elapsed since the overexposure. See paragraph 8c of this regulation for immediate ophthalmic examination protocol.

d. Termination vision screenings will be performed on all laser workers and incidental laser personnel who work with Class 3B and 4 lasers when they terminate their employment. If the termination screenings are performed prior to the worker's departure, the Installation Occupational Health physician should make an entry on the DA Form 5571 (Master Problem List) within the worker's medical records indicating the need for a termination screening. Individuals with abnormal findings will be referred for a diagnostic examination.

8. Vision/Ocular Assessment Protocols for Personnel in Laser Environments.

a. Pre-placement and termination vision screenings will be performed as indicated below:

(1) Laser workers will have an ocular history recorded, distant and near visual acuity measured for each eye (with corrective lenses if applicable), a test for color recognition conducted, and a test for central visual fields and macular function (Amsler Grid or similar test) performed by an individual qualified to accurately administer the test. If any abnormal findings are noted, such as visual acuity less than 20/20 in either eye, distortions, or missing portions of the Amsler Grid, the worker will be referred to an optometrist or ophthalmologist for a diagnostic examination. (Note: Laser workers that have not previously had an Amsler Grid Test should have one performed as soon as practical and have the results recorded in their occupational health chart.)

(2) Incidental laser personnel will have each eye screened for visual acuity (with corrective lenses, if applicable). If visual acuity is less than 20/20 in either eye, the worker will be referred to an optometrist or ophthalmologist for a diagnostic examination.

b. An optometrist or ophthalmologist will perform diagnostic examinations to determine the cause of any abnormal findings of the visual system.

c. An optometrist or ophthalmologist will perform immediate examinations. The examination will include the following as a minimum:

(1) Ocular history, with emphasis on previous eye injury or disease and use of any medications, especially those with photosensitizing side effects.

(2) Distance visual acuity (with correction) in each eye. If the corrected distance visual acuity is less than 20/20 in either eye, refraction will be performed to obtain the best-corrected visual acuity.

(3) An Amsler Grid or similar pattern test for macular function to detect distortions, scotomas, or other abnormal findings when present.

(4) A slit lamp biomicroscope examination of the cornea, crystalline lens, and other structures accessible to this instrument, recording at a minimum, the presence or absence of opacities in the ocular media.

(5) Ocular fundus evaluation through dilated pupil (unless medically contraindicated) describing, at a minimum, the sharpness of the optic nerve head margins, cup-to-disc ratio, absence of blood, size and condition of retinal blood vessels, disturbances of pigmentation, presence or absence of a well-defined macula and fovea reflex, and any retinal abnormalities noted.

(6) Ocular Fundus Photography, including the macular area, optic disc area, and any retinal abnormalities noted. If photography cannot be performed, a representation of the findings should be drawn manually.

9. Overexposure Reporting. For any known or suspected overexposure to laser radiation, contact the IRSO. Overexposures within the USA MEDDAC (or any other unit with an RSO) should report to the unit RSO. In addition, contact the US Army Public Health Command, Triservice Vision Conservation and Readiness Program, at DSN 584-2714, Commercial (410) 671-2714, or via e-mail at laserincident@amedd.army.mil, as soon as possible after the overexposure occurs.

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