

1. Keywords

HAZARDOUS EXPOSURE
IONIZING RADIATION

2. Start Date: FY 89 Quarter 2
End Date: FY 89 Quarter 3

3. HQ Division: 43 - HEALTH PHYSICS DIVISION

4. Phase:

5. Program NO: 28

6. Survey Type: RS - INDUSTRIAL RADIATION SURVEY

7. INSTALLATION OR SOURCE OF INFORMATION (CITY & STATE OR
COUNTY ARE ESSENTIAL)
HS - USA HEALTH SERVICES COMMAND

8. Authors:

9. ARLOC/Activity: 11933 010 - USA DENTAC
Location: WALTER REED AMC
State: DC

10. Project Control Number: 43-0217-89

11. Title: RADIATION PROTECTION SURVEY

12. DSA: 61



DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-6422

REPLY TO
ATTENTION OF

HSHB-MR-HM (40)

8 June 1989

MEMORANDUM FOR Commander, U.S. Army Health Services Command,
ATTN: HSCL-P, Fort Sam Houston, TX 78234-6000

SUBJECT: Radiation Protection Survey No. 28-43-0217-89, Walter
Reed Army Medical Center/Dental Activity, Washington, DC,
9-19 January 1989

I. REFERENCES. A list of references is provided as Enclosure 1.

II. AUTHORITY.

A. AEHA Form 250-R, HSC, 12 July 1988.

B. Memorandum, USAEHA, HSHB-M, 14 December 1988, subject: USAEHA Schedule of Field Services, FY 89.

III. PURPOSE. This survey was performed to assist in your efforts to use sources of ionizing radiation safely and IAW current regulatory requirements. Specifically, this survey was performed to:

A. Alert you to any previously unknown health hazards or areas of noncompliance with regulatory requirements associated with the use of the sources.

B. Provide recommendations to correct the health hazards, ensure regulatory compliance, and improve your radiation protection program.

C. Give onsite advice to further assist in improving your program.

IV. GENERAL.

A. An entrance interview for WRAMC was held with MAJ Gerald M. Connock, MS, RPO, WRAMC, and selected staff members.

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b8-L100-37-88 40-5f WRA FNC / DENTAC, Washington, DC (89)

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B. An exit briefing for WRAMC was held with COL James E. Hastings, MC, Deputy Commander for Clinical Services; COL Donald Johnson, MS, Deputy Commander for Administration; MAJ Connock and selected staff members.

C. A separate exit briefing for the DENTAC was held with COL Robert Brady, DC, Commander; Mr. Wilbur McCottry, DAC, RPO; and MAJ Connock, RPO, WRAMC.

D. The most recent survey of the overall radiation protection program at the WRAMC/DENTAC, by USAEHA, was conducted 9-20 March 1987 (Radiation Protection Survey No. 28-43-0701-87).

E. A list of abbreviations is given in Enclosure 2.

F. This survey was performed by CPT(P) Michael A. Coogen, MS, Mr. John Manfre, DAC, and SGT Michael Hoerr, USA, Health Physics Division, USAEHA.

V. FINDINGS.

A. General.

1. MAJ Connock and Mr. David W. Burton, DAC, were designated, in writing, as the WRAMC RPO and ARPO, respectively.

2. Mr. McCottry and COL Brady, were designated, in writing, as the DENTAC RPO and ARPO, respectively.

3. The radiation protection program for WRAMC/DENTAC was administered by WRAMC Regulation 40-10, dated April 1987. This regulation appeared adequate for its intended purpose.

4. The following individuals were designated, in writing, as local RPOs for the following tenant commands:

a. MAJ Melissa Rosado De Christenson, MC, USAF, for the Armed Forces Institute of Pathology.

b. Mr. Billy G. Bass, Ph.D, DAC, for the Walter Reed Army Institute of Research.

B. Personnel Dosimetry Program.

1. All personnel observed to be occupationally exposed to ionizing radiation utilized the Army personnel dosimetry program.

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2. SSG Kenneth S. Baugh, USA, was designated, in writing, as the individual responsible for maintaining the DD Forms 1141, Record of Occupational Exposure to Ionizing Radiation and the ADRs for WRAMC/DENTAC. However, no individual had been designated, in writing, as the custodian of the DD Forms 1952, Dosimeter Application and Record of Occupational Radiation Exposure for WRAMC/DENTAC.

3. The DD Forms 1952 were maintained; however, in most instances, they were incomplete. Specifically, the exposure information section, items 11 through 20, was generally incomplete.

4. In the opinion of the survey officers, exposures to ionizing radiation at the WRAMC/DENTAC were maintained ALARA. This was evident by:

a. A review of DD Forms 1141 and ADRs indicated that, at the time of the survey, 503 personnel were identified as radiation workers by their inclusion in the Army dosimetry program.

b. All had received accumulated exposures in the preceding year of less than 10 percent of the applicable whole-body dose equivalent limits (AR 40-14).

c. The ADRs were reviewed quarterly by the RPO.

d. The TLDs were stored in locations approved, in writing, by the RPO, with the following exceptions:

(1) At AFIP, TLDs were stored in the room where the C-arm mobile x-ray system was used.

(2) In the Urology Service, TLDs were stored in physicians' offices.

e. One hundred forty-one individuals were included in the WRAMC Health Physics Office bioassay monitoring program. Of those results available for review, all had received internal exposures in the preceding year of less than 10 percent of the annual radiation exposure standards for specific radionuclides as established by the ICRP and NCRP.

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5. Dose equivalents for positive thyroid burdens of radioiodine were calculated for bioassay results in excess of the minimum detectable amount and these results were reported to AIRDC.

C. Radioactive Materials.

1. The use of radioactive materials for diagnosis, therapy, medical research and development, instrument check, and calibration was authorized by NRC Byproduct Material License No. 08-01738-02 (expiration date 31 July 1987) at the following locations: WRAMC, Washington, DC; WRAMC Forest Glen Section and Annex, Silver Spring, Maryland; USAMRIID, Fort Detrick, Maryland; Andrew Rader U.S. Army Health Clinic, Fort Myer, Virginia; WRAIR Animal Holding Facility, Washington, DC; U.S. Army Medical Laboratory, WRAMC Department of Pathology, Fort Meade, Maryland; and U.S. Army Institute of Dental Research, Washington, D.C. A renewal application for NRC License No. 08-01738-02 had been submitted and the NRC responded, in writing, Docket No. 030-01317, Control No. 107349, stating that the application had been submitted in a timely manner.

2. The use of radioactive materials for animal irradiators at WRAIR and USAMRIID was authorized by NRC Byproduct Material License No. 08-01738-03, Amendment 17 (expiration date 31 May 1991).

3. The use of small quantities of radioactive byproduct material for In-vitro Clinical and Laboratory Tests at WRAMC, Forest Glen Section and Annex, and U.S. Army Medical Laboratory, WRAMC, was authorized by NRC Registration Certificate, In-vitro Testing, Registration No. 6158 (dated 27 November 1981).

4. The use of radioactive materials, which are not controlled by the NRC, for human use, research and development, and instrument check, and calibration was authorized by DA Radiation Authorization No. A08-07-90 (expiration date 30 June 1990) under the same conditions as NRC License No. 08-01738-02 at the following locations: WRAMC, Forest Glen Section and Annex; Fort Detrick; Fort Myer; Fort Meade, and the Pentagon Health Clinic.

5. A Radiation Control Committee was established and was meeting quarterly. A review of the minutes indicated that the Committee was taking an active part in managing the radiation protection program.

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6. A review of records and interviews with staff members of Nuclear Medicine Services, Radiation Therapy, and Health Physics Office revealed that the human use activities were being performed IAW TB MED 525, NRC License Conditions, DA Radiation Authorization, and applicable 10 CFR 19, 20, 21, 30 thru 35, 61 and 71, except that military police personnel were not given an inventory containing the location and type of radioactive material stored within WRAMC, Forest Glen Section and Annex, and WRAIR. However, a copy of the inventory of radioactive materials to include usage locations and storage areas, was in the process of being forwarded to the military police.

D. Diagnostic X-Ray Facilities.

1. Medical X-Ray Facilities. A review of records, a site visit, and interviews with staff members revealed that medical radiology facilities were established and maintained IAW regulatory requirements with the following exception: In the Department of Radiology the x-ray technicians do not have direct control of access to the doors from the dressing room area into the x-ray suites due to the fact that the dressing room doors had no locking mechanisms to preclude unauthorized entry.

2. Dental X-Ray Facilities. Dental radiology facilities were established and maintained IAW regulatory requirements.

3. Armed Forces Institute of Pathology X-Ray Facilities. The x-ray facilities were established and maintained IAW regulatory requirements, with the following exception: There was no documentation to indicate that the lead aprons used in conjunction with the C-arm mobile fluoroscopic x-ray had been inspected annually for safety defects as required by TB MED 521.

E. Records, Reports, and Surveys.

1. A complete inventory of ionizing radiation sources was available for review.

2. Radiation protection surveys and maintenance procedures for diagnostic x-ray systems were conducted, with the following exceptions:

a. Incident skin exposures from automatic exposure control on chest x-ray systems were not evaluated.

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b. DD Forms 2163, Medical Equipment Verification/Certification (label), were not up to date for approximately 75 percent of the x-ray systems calibrated by WRAMC Medical Maintenance.

3. Monthly and weekly surveys of areas, where radioactive materials were used and stored, were conducted IAW regulatory requirements to include measurements of exposure levels with an exposure rate meter and wipe smears.

4. Records were available to indicate that instrument checks and calibrations were conducted IAW the NRC License.

5. The RCC minutes were forwarded to HSC and OTSG in a timely manner IAW regulatory requirements.

6. Collective exposure to ionizing radiation (Person-rem in a quarter, average exposure in rem/quarter and highest exposure in rem) were not reported to the RCC.

7. Misadministrations involving the human use of radiopharmaceuticals were reported to the NRC and the RCC in a timely manner.

8. Records were available to indicate that the Nuclear Regulatory Commission, Region I, King of Prussia, PA, had performed an inspection on 11 July 1988. Noted were three citations of noncompliance, with corrective actions that were implemented by memo dated 11 July 1988.

9. No records were available to indicate that annual radiation protection training for personnel assigned to the Cardiac Catheterization service had been conducted.

10. Annual radiation protection training for the DENTAC had been conducted; however, no documentation was available for review.

11. No documentation was available to indicate that housekeeping personnel, who routinely entered areas where radioactive materials are used and stored, received annual training in radiation protection and procedures in the last year; however, training had been scheduled for 19 January 1989.

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F. Quality Assurance.

1. Department of Radiology (including x-ray facilities in the Orthopedic Clinic and Special Procedures Suite).

a. Documentation was not available to indicate that quarterly evaluations of radiographic cassettes for film-screen contact, screen conditions, light leaks and film-screen combinations were conducted in the Department of Radiology, in the Orthopedic Clinic and in the Special Procedures Suite. However, in the opinion of the survey officers, these evaluations were performed.

b. Daily records relating to retakes and reasons for rejection (i.e., the examination, projection, technologist, and x-ray system) were not available for review and this information was not reviewed weekly in the Department of Radiology, Orthopedic Clinic and Special Procedures Suite. However, sufficient documentation was available to indicate that a monthly reject analysis was performed.

2. Urology Service.

a. Daily records relating to radiographic retakes were available for review; however, they were not reviewed weekly.

b. Documentation was not available to indicate that an evaluation of the index of speed, index of contrast, solution temperature and base plus fog was conducted daily.

c. Documentation was not available to indicate that radiographic cassettes were evaluated quarterly for film screen contact, screen conditions, light leaks, and film screen combinations.

3. DENTAC. Documentation of a radiographic quality assurance program at the DENTAC was available for review and was conducted in an exemplary manner, with one minor exception: Panoramic cassettes were evaluated on a quarterly basis for film screen contact, screen conditions and light leaks, but the evaluations were not documented.

VI. DISCUSSION. During the survey, COL David G. McLeod, MC, Chief, Department of Urology, presented to the survey officers a memorandum, dated 16 December 1988, subject: Radiologic Technologist Hastings Law, concerning the new mandate which

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requires personnel performing x-rays to be radiologic technologists. COL McLeod's concerns about radiographic technologist training for Department of Urology personnel, in order to meet the discussed mandate, were discussed with the RPO and the Deputy Commander for Clinical Services. The subjects discussed were: the applicability of the mandate and whether this topic is a point of order for the RCC to discuss. It was suggested by the survey team that the RCC should be informed of and evaluate this concern, and if determined to be required, that WRAMC seek HSC guidance.

VII. CONCLUSION. A review of the findings indicated that there were no apparent health hazards resulting from the use of ionizing radiation sources at WRAMC/DENTAC. The overall radiation protection program was conducted IAW regulatory requirements for radiation protection, with exceptions for which the following recommendations are provided.

VIII. RECOMMENDATIONS.

A. General. None required.

B. Personnel Dosimetry Program.

1. Ensure that an individual is designated, in writing, by the Commander as the person responsible for maintaining the DD Forms 1952 for WRAMC/DENTAC [AR 40-14, paragraph 4e(8)].

2. Maintain complete and accurate DD Forms 1952 for WRAMC/DENTAC (AR 40-14, paragraph 11d).

3. Store personnel dosimeters in locations approved by the RPO in the Department of Urology at WRAMC and Armed Forces Institute of Pathology (AR 40-14, paragraph 10a).

C. Radioactive Material. Notify the Military Police personnel of the location of radioactive materials utilized by WRAMC [AR 40-5, paragraph 9-9b(5)].

D. Diagnostic X-Ray Facilities.

1. Install locks that allow the x-ray operator control of access to the x-ray rooms from the dressing rooms in the Department of Radiology at WRAMC [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 4-4d].

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2. Ensure that the lead aprons at Armed Forces Institute of Pathology are inspected for safety defects at least annually [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-9f].

E. Records, Reports and Surveys.

1. Ensure that the radiation protection surveys performed on the diagnostic x-ray systems at WRAMC include an evaluation of incident skin exposure to an average individual from each automatic exposure controlled chest x-ray system [AR 40-5, paragraph 9-9b(7) and TB MED 521, paragraph 5-3b(11)].

2. Update the DD Forms 2163 upon completion of each scheduled calibration/verification (AR 40-61, paragraph 6-6c).

3. Ensure that the RPO reports information concerning ionizing radiation exposure to the RCC as follows: collective exposure, average exposure, and the highest exposure IAW AR 40-5, paragraph 9-6a(3.1 and 3.2).

4. Conduct and document annual training in radiation protection practices and in the biological effects and risks to employees and patients from ionizing radiation exposure for personnel assigned to Cardiac Catheterization [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-2c(2)].

5. Document annual training conducted in radiation protection practices and in the biological effects and risks to employees and patients from ionizing radiation exposure for DENTAC personnel [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-2c(2)].

6. Ensure that housekeeping personnel receive annual training in radiation protection practices and procedures in areas where radioactive materials are used and stored [AR 40-5, paragraph 9-9a(2)(b), and Title 10, CFR Part 19.12].

F. X-Ray Quality Assurance.

1. Department of Radiology (including x-ray facilities in the Orthopedic Clinic and Special Procedures Suite).

a. Document quarterly evaluations of radiographic cassettes for film-screen contact, screen conditions, light leaks, and film-screen combinations [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-10f(12)].

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b. Maintain x-ray retake logs including the reasons for rejection (i.e., the examination, projection, technologist, and x-ray system) on a daily basis. Ensure that all retake logs are reviewed on a weekly basis [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-10f(5)].

2. Urology Service.

a. Review the x-ray retake log on a weekly basis for trends [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-10f(5)].

b. Perform and document daily evaluation of the index of speed, index of contrast, solution temperatures and base plus fog for Urology film processors [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-10f(9)].

c. Evaluate radiographic cassettes on a quarterly basis for film-screen contact, screen conditions, light leaks and film-screen combinations [AR 40-5, paragraph 9-9b(7), and TB MED 521, paragraph 2-10f(12)].

3. DENTAC. Document quarterly evaluations of radiographic cassettes for film-screen contact, screen conditions, light leaks, and film-screen combinations [AR 40-5, paragraph 9-9b(7), and, TB MED 521, paragraph 2-10f(12)].

FOR THE COMMANDER:

2 Encls

for Arthur B. Webb, LTC, MS
MICHAEL W. MUELLER
MAJ, MS
Chief, Health Physics Division

CF:

HQDA(SGPS-PSP)

Cdr, HSC, ATTN: HSDS

Cdr, USAMMA, ATTN: SGMMA-MP

Cdr, WRAMC (2 cy)

Cdr, WRAMC, ATTN: PVNTMED Svc (2 cy)

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REFERENCES

1. AR 40-14, 15 March 1982, Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials.
2. TB MED 525, 10 March 1988, Control of Hazards to Health from Ionizing Radiation Used by the Army Medical Department.
3. Title 10, Code of Federal Regulations (CFR), 1988 rev, Chapter I, Nuclear Regulatory Commission.
4. TB MED 521, 15 June 1981, Management and Control of Diagnostic X-Ray, Therapeutic X-Ray, and Gamma-Beam Equipment.
5. AR 40-5, 30 August 1986, Preventive Medicine.
6. AR 40-61, 30 April 1986, Medical Logistics Policies and Procedures.
7. HQ HSC Directorate of Dental Services Commanders Guide, January 1986.

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ABBREVIATIONS

ADR	Automated Dosimetry Record
AFIP	Armed Forces Institute of Pathology
ALARA	as low as is reasonably achievable
ARPO	Alternate Radiation Protection Officer
CFR	Code of Federal Regulations
DAC	Department of the Army Civilian
DENTAC	U.S. Army Dental Activity
HSC	U.S. Army Health Services Command
IAW	in accordance with
ICRP	International Commission on Radiological Protection
NCRP	National Council on Radiation Protection and Measurement
NRC	Nuclear Regulatory Commission
RCC	Radiation Control Committee
RPO	Radiation Protection Officer
TLD	thermoluminescent dosimeter
USAEHA	U.S. Army Environmental Hygiene Agency
USAF	U.S. Air Force
USAMRIID	U.S. Army Medical Research Institute for Infectious Disease
WRAIR	Walter Reed Army Institute of Research
WRAMC	Walter Reed Army Medical Center