RADIATION SAFETY PROGRAM MANUAL

VETERANS ADMINISTRATION CENTER

Los Angeles, California

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1. INTRODUCTION. In recent years rapid developments in nuclear medicine have led to an unprecedented expansion in the use of radioactive materials for diagnosis, therapy, and research activities throughout this Center. As a licensee of the Atomic Energy Commission, the Veterans Administration has a legal and moral obligation to provide for the safety of its personnel from the radiation hazards necessarily accompanying the use and handling of such materials. In order to continue fulfilling this obligation it is required (Department of Medicine and Surgery Manual, Revision of June 18, 1958, M-3, Part I, paragraph 4.06) that the Chief, Radioisotope Service, with the approval of the Hospital Radioisotope Committee, formulate a complete radiation safety program and appoint a Radiation Safety Officer, who will be specifically assigned the responsibility for effecting the program. The Radiation Safety Officer is responsible to the Chief, Radioisotope Service, who in turn is responsible to the Manager for matters of radiation safety.

2. AUTHORITY AND RESPONSIBILITY FOR THE USE OF RADIOACTIVE MATERIALS. The approval of applications for clinical or research studies involving radioactive materials at this Center by investigators and other qualified personnel is a function of the Hospital Radioisotope Committee, a subcommittee of the Veterans Administration Center's Research and Education Committee. Only this subcommittee can authorize human applications of radioisotopes. Normally the Radiation Safety Officer is concerned only with the radiation safety aspects of such applications.

Beyond the scope of the Radioisotope Service or the Radiation Safety Officer, and properly the responsibility of the Radiology Service, are the safety problems associated with the use of x-ray and teletherapy machines as well as radium needles.

3. RADIOACTIVE MATERIALS. The primary requisite of an effective radiation safety program is the precise knowledge of the location and description of all radioactive materials present on this Center at all times. The Radiation Safety Officer has adequate knowledge and control of all radioisotopes distributed through the Radioisotope Service. For complete control it is necessary that the Radiation Safety Officer be promptly notified of the arrival at this Center of any radioactive materials from any outside source. This includes:

A. The transfer of any radioactive materials from the UCLA Medical Center for use on the VA Center; the receipt of any gift of radioactive materials from private or commercial sources for use on the Center; and radioactive materials received from any other sources by any means.

B. Any radioactive specimens of blood, urine, tissue, etc., brought onto these premises for analyses of any kind.

C. Any radioactive animals, dead or alive, or parts thereof, brought onto these premises for any purpose whatsoever.

Although the Radiation Safety Officer may have been alerted to the expected

arrival of such materials through protocols approved by the Hospital Radioisotope Committee, it is still incumbent upon the recipient to inform the Radiation Safety Officer upon the arrival of such materials at the Center. Such notification can be made by person to person telephone conversation with the Radiation Safety Officer at Ext. 4276 or 6237. Notification must also be made within 24 hours by written memo to the Radiation Safety Officer in care of the Radioisotope Service.

In order to comply with the Atomic Energy Commission regulations concerning a permanent record of the disposition of all radioactive materials, it is equally essential to inform the Radiation Safety Officer of the transfer of any VA-owned radioactive materials for use off the Center. Written notification of such transfers on forms supplied by the Radiation Safety Officer become part of the permanent records of the Radiation Safety Officer.

4. PERSONNEL ENGAGED IN THE HANDLING OF RADIOACTIVE MATERIALS. All personnel engaged in the handling of radioactive materials at this Center, whether or not they are employees of the Veterans Administration, come under the jurisdiction of the Radiation Safety Officer. All personnel so engaged will be issued film badges or other necessary types of personnel monitoring instruments. Each person issued any type of monitoring device is responsible for returning same at specified times to the Radiation Safety Officer for evaluation. In some instances the responsibility for personnel moni-

toring will be delegated to some other authority, who will provide the Radiation Safety Officer with all personnel exposure data.

Pre-use and termination medical examinations are required of all individuals engaged in the handling of radioactive materials. These examinations include a chest x-ray, a complete blood count and urinalysis. In addition annual blood counts and urinalysis are required. All examinations are made by the Veterans Administration, although the requirement can also be fulfilled by submitting the written results of a similar examination by some other competent authority. All medical and personnel exposure data become part of the permanent records of the Radiation Safety Officer.

5. ROUTINE AREA MONITORING SURVEYS. All areas (laboratories, hospital wards, clinics, etc., in Wadsworth, Domiciliary and Brentwood) in which radioactive materials are stored or employed will be routinely monitored by trained personnel of the Radioisotope Service. The only duly authorized exceptions to this survey are the Radiology Services at Wadsworth, Annex Building 114, and Brentwood. Such surveys will be conducted at least once a month under usual circumstances, and more often as necessary to insure adequate control of any existing radiation hazards. Routine area monitoring data become part of the permanent records of the Radiation Safety Officer.

6. GENERAL RULES FOR SAFE HANDLING OF RADIOACTIVE MATERIALS. Personnel should remember that in any safety program a large part of the responsibility rests on the individual worker,

who should at all times conform conscientiously to the rules of radiation safety laid down by the Atomic Energy Commission (Federal Register, Title 10, Atomic Energy; Safe Handling of Radioisotopes, Handbook 42, National Bureau of Standards, 1949). All personnel engaged in handling radioactive materials on approved projects should be familiar with the general concepts of radiation and should have had instruction in the safe handling of radioactive materials. The following general rules must be observed.

A. There shall be no smoking, eating, applying of cosmetics, setting down of personal effects such as combs, purses, etc. in any work area where radioactive materials are being used.

B. There shall be under no circumstances any mouth pipetting of solutions containing radioactivity at any level.

C. Even tracer amounts of radioactive materials must be handled with laboratory coats protecting normal attire.

D. When necessary, protective equipment must be used, i.e. rubber gloves, etc. This is especially important when there are open wounds or bruised skin areas on the hands. No person with a break in the skin below the elbow shall work, without suitable protection, in any area where radioactive materials are being used.

Deposition of radioactive materials in the body represents the most important type of personnel hazard. Such materials can enter

the body through the mouth by accident, through the lungs by inhalation of vapor, spray, or dust, or through the skin by contact with intact of injured body surface. Since localization in the lung is virtually impossible to detect, it is especially important to prevent the inhalation of radioactive materials. Once radioactive material has entered the body by any route it is virtually impossible to expedite its removal by other than its natural rate. Internal hazards can be avoided by strict adherence to the general rules listed above. Proper shielding, distance, and exposure time will pervent radiation hazards due to external radiation.

7. HANDLING OF PATIENTS, CADAVERS, AND TISSUES CONTAINING RADIOACTIVITY.

A. All patients who have received therapeutic amounts of radioactive materials and who present a radiation hazard will be cared for on Ward B in Bldg. 114.

B. Patients containing diagnostic amounts of radioactive materials present no radiation hazard. Tissues obtained from such patients should be handled with rubber gloves to minimize contamination potential.

C. All cadavers and tissues containing therapeutic amounts of radioactive materials may present a radiation hazard to pathologists (autopsy surgeons) and embalmers. When such a hazard exists Pathology will be alerted by a pink card (Form 10-212) which will have been placed in the clinical

chart by the person administering radioactive materials to the patients. Embalmers will be alerted by the presence of a radiation warning sticker on the back of the bed tag, which is routinely examined before beginning the embalming procedure. Personnel in the above Services have been properly informed of necessary precautions and procedures by letter from the Chief, Radioisotope Service, dated January 10, 1958. Personnel in these Services are encouraged to call the Radiation Safety Officer at Ext. 4276 or 6237 at any time should any questions arise.

8. DISPOSAL OF RADIOACTIVE WASTES. The disposal of radioactive waste materials at this Center is the responsibility of the Radiation Safety Officer. Before beginning work on any projects involving radioactive substances, waste disposal problems, if any, must be discussed with the Radiation Safety Officer and proper procedures clearly delineated.

9. ACCIDENTS. ALL ACCIDENTS INVOLVING RADIOACTIVE MATERIALS MUST BE REPORTED PROMPTLY TO THE RADIATION SAFETY OFFICER AT EXT. 4276 or 6237.

A. Area contamination. The Radiation Safety Officer will evaluate the hazard and advise on procedures for dealing promptly with the contamination. In the event of major contamination with a serious potential hazard, the area should be vacated and roped off, pending the arrival of the Radiation Safety Officer or a competent substitute.

B. Personnel contamination.

a. External or surface contamination of persons is in general best treated by washing with pure soap and warm water. Avoid the use of organic solvents, which, like alkaline, abrasive soaps, only tend to make the skin more permeable to harmful substances. Specific procedures are prescribed as follows:

1. Wash for not less than 2 minutes, nor more than 3 minutes, with mild pure soap and tepid water, covering the affected area with abundant lather. Give special attention to areas between fingers and around finger nails. Repeat not more than 3-4 times as monitoring indicates.

2. If 1 fails, then repeat using a soft hand brush.

3. If 2 fails to eliminate the contamination, then apply titanium oxide paste (with lanolin) and work over areas for 2 minutes. Rinse with water to remove all the paste, especially around the nails.

b. When cut by glassware, injured by hypodermic needle or other instruments, immediately wash the wound under a strong stream of running water. Report the accident immediately to the Radiation Safety Officer, who will provide for prompt attention.

c. Accidental swallowing of radioactive material should be treated like acute poisoning of other types. Large volumes of water, with or without emetics, should be used with throat stimulation by the fingers, to induce vomiting. The Radiation Safety Officer must be called immediately to arrange for prompt medical attention.

C. Off-hour emergencies

The following personnel are available for any emergency occurring after the usual working hours.

	Phone No.
1. Dr. John C. Erickson	VE 8-1892
2. Panchita B. Thomas	EX 7-5200
3. Dr. W. H. Blahd	GL 4-8231

10. RECOMMENDED READING

a. Veterans Administration Department of Medicine and Surgery Manual. Research Program. M-3, Part I. Change 3, June 13, 1958.

b. Federal Register. Title 10-Atomic Energy, Chapter I, Part 20. Standards for protection against radiation. January 29, 1957.

c. Manual on use of radioisotopes in hospitals. American Hospital Association, 1958.

d. What nurses should know about isotopes. The Modern Hospital, August, 1955.

e. Safe handling of radioactive isotopes. National Bureau of Standards, Handbook 42, 1949.

f. Recommendations for waste disposal of phosphorus-32 and iodine-131 for medical users. National Bureau of Standards, Handbook 49, 1951.

g. Radiological monitoring methods and instruments. National Bureau of Standards, Handbook 51, 1952.

h. Safe handling of bodies containing radioactive isotopes. National Bureau of Standards, Handbook 65, 1958.

i. Manual for Radiation Safety. University of California, 3rd Ed., July, 1958.

j. The Practice of Nuclear Medicine. William H. Blahd, Franz K. Bauer and Benedict Cassen. Charles C. Thomas, 1958.

k. Clinical Use of Radioisotopes. William H. Beierwaltes, Philip C. Johnson, Arthur J. Solari. W. B. Saunders Co., 1957.