VOID SHEET

TO: License Fee Management Branch

FROM: Region 4

SUBJECT: VOIDED APPLICATION

Control Number: 465425

Applicant: Dept of the Army, Brooke Army Medical Center (42-01368 02)

Date Voided: 1/27/97

Reason for Void: _____

License requested termination of licensee (see MC # 46623b). No review accomplished

Jacqueline Burks 1/27/97
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

☐ Refund Authorized and processed

☐ No Refund Due

☐ Fee Exempt or Fee Not Required

9702200230 970127
PDR ADOCK 03000504
C PDR

Comments: _____

Log completed ☐

ML40

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

OCT 18 1994

Department of the Army
ATTN: HSHE-MP
Brooke Army Medical Center
Fort Sam Houston, Texas 78234-6200

Docket No. 030-00504
License No. 42-01368-02
Control No. 465425

Gentlemen:

This is to acknowledge receipt of your application for renewal of the byproduct material license identified above. Your application is deemed timely filed and, accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By
Billie Gruszynski

Billie Gruszynski (Ms.)
Nuclear Materials Licensing Branch

OCT 18 1994

RIV:NMLB
BGruszynski
10/18/94

Acceptance Review Check List

Action Type:
[ ] New
[ ] Amendment
[ ] Renewal

Teletherapy 42-01328-02

Mail Control No. 46425

Dept of the Army - Brooke Army Medical Center, Ft. Sam Houston, TX

Initials of Individual completing Form

Date: JUL 24 1996

Administrative Exclusion Items Requiring Return to Applicant:

[ ] Current Guidance Not Used
[ ] References in Application Not to Current Regulations
[ ] All Attachments Referenced Are Not Included
[ ] Signature Not on Application

No current NRC Guidance.

Technical Exclusion Items Requiring Technical Reviewer Time Estimates:

[ ] Request for Expedited Handling for Radiation Safety/Business Concerns
[ ] Request for Exemption to Specific Regulation(s)
[ ] Change in Ownership Concerns
[ ] Financial Assurance/DFP Required — Addressed in LC
[ ] Decommissioning Plan Review
[ ] Quality Management Plan LTS - indicates that QMP has been submitted.
[ ] Termination of License Requiring NRC Closeout Survey
[ ] Bankruptcy Notification
[ ] Approval of Long Term Storage/Alternative Form of Waste Disposal
[ ] Facility Modifications Requiring Shielding Calculations
[ ] Authorization to Possess and Use Large Quantities of Unsealed Materials
[ ] HDR/Gamma Knife
[ ] Major Increase In Authorized Users
[ ] Approval Of Training Program
[ ] Approval of Incineration of Radioactive Waste
[ ] Authorization For Sealed Source or Device Requiring SSD Approval Review
[ ] Environmental Assessment or Impact Statement Required
[ ] Emergency Plan Contingency Plan Required
[ ] Type A Broad Scope/Complex Research & Development Application

Inspection 12/19/94
NRC-591 / Clear

Reviewer:_____

Estimate of Time Needed:

[ ] 30 Days [ ] 60 Days [ ] 90 Days [ ] Other

Comments:

_____

_____

_____

DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MEDICAL COMMAND
2050 WORTH ROAD
FORT SAM HOUSTON, TEXAS 78234-6000

REPLY TO
ATTENTION OF

October 11, 1994

Preventive Medicine
and Wellness Division

U.S. Nuclear Regulatory Commission
Region IV
Nuclear Materials Safety Section
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Dear Sir:

Enclosed are two copies of an application to renew Byproduct Material License Number 42-01368-01, Brooke Army Medical Center, Fort Sam Houston, Texas, in its entirety.

Recommend approval.

Sincerely,

Peter H. Myers
Colonel, U.S. Army
Radiological Hygiene Consultant

Enclosure

CF: Cdr, USAEHA, ATTN: HSHB-MR-H, APG, MD 21010-5422
Cdr, USBAMC, ATTN: HSHE-DHR, Ft Sam Houston, TX 78234-6200

DEPARTMENT OF THE ARMY
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234-6200

REPLY TO
ATTENTION OF

HSHE-DHR (385-11m) 11 October 1994

MEMORANDUM FOR Headquarters U.S. Army Medical Command, ATTN: MCHO-CL-W, 2050 Worth Road, Fort Sam Houston, TX 78234-6000

SUBJECT: Application to Renew U.S. Nuclear Regulatory Commission Materials License No. 42-01368-02

1. Request submission of the enclosed application to renew Materials License 42-01368-02 to the U.S. Nuclear Regulatory Commission.

2. Please forward the application to:

U.S. Nuclear Regulatory Commission - Region IV
Nuclear Materials Licensing Branch
611 Ryan Plaza Drive
Suite 400
Arlington, Texas 76011-8064

3. Our point of contact is Major Jonathan E. Tucker, MS, Radiation Protection Officer, DSN 429-7181/7494 or commercial (210) 916-7181/7494.

FOR THE COMMANDER:

DOUGLAS E. MILLS
Lieutenant Colonel, MS
Chief, Information Management Division

Encl
as

INFORMATION SUBMITTED IN SUPPORT OF REQUEST TO RENEW

BYPRODUCT MATERIAL LICENSE 42-01368-02

References

1. U.S. Nuclear Regulatory Commission (NRC) Draft Regulatory Guide FC 414-4, Guide for the Preparation of Applications for Licenses for Medical Teletherapy Programs, dated December 1985.

2. Brooke Army Medical Center Memorandum No. 40-72 (BAMC Memo 40-72), Ionizing Radiation Protection Program, dated 16 August 1994 (***ATT 1***).

3. Materials License No. 42-01368-01, Brooke Army Medical Center (Type A Broad Scope).

Application

a. Number of license to be renewed. 42-01368-02

b. Name of licensee to be used in item 1 of the renewed license.

Department of the Army
Brooke Army Medical Center

c. Mailing address to be used in item 2 of the renewed license.

Health Physics Office
HSHE-DHR
Building 1188
Fort Sam Houston, Texas 78234-6390

d. Location of teletherapy unit.

Brooke Army Medical Center
Building 1000, Room 36A
Fort Sam Houston, Texas

e. Teletherapy unit. Location of teletherapy unit is the same as described in application dated February 24, 1984, and letter dated July 26, 1989. No changes have been made that affect radiation levels in surrounding areas of that affect the patient viewing system.

f. Electrical and mechanical stops. All electrical and mechanical stops that limit use of the primary beam of radiation are still installed and continue to operate as described in the last survey report, dated July 13, 1992, submitted to the NRC.

g. Current authorizations. Current authorizations in items 6 through 9 of materials license no. 42-01368-02 (regarding radionuclide, description of sealed sources and teletherapy unit, maximum possession limit, and authorized use) are correct.

h. Authorized users. The list of authorized users in condition 12 of materials license no. 42-01368-02 is correct.

i. RSO. The RSO, Major Jonathan E. Tucker, is the same as condition 11 of materials license no. 42-01368-02.

j. Item 8 - Training for Individuals Working in or Frequenting Restricted Areas. We will establish and implement the model training program that was published in Appendix D to Draft Regulatory Guide FC 414-4.

Item 10.5 - Operating procedures. See ***ATT 10.5***.

Item 10.6 - Emergency Procedures. See ***ATT 10.6***.

k. Item 10.1 - Personnel Monitoring Program. We have established and agree to follow written procedures for personnel monitoring that include as requirements, the criteria specified in Item 10.1.2 of Draft Regulatory Guide FC 414-4.

Item 10.2 - Instrumentation. We have available for use the instrumentation specified in Item 10.2.2 of Draft Regulatory Guide FC 414-4.

Item 10.3 - Calibration of Portable Survey Instruments. Survey instruments will be calibrated at intervals not to exceed one year and after repair. A record of the calibration showing the date, the results of the calibration, and the name of the organization that provided the service will be maintained for at least two years after each calibration. Calibration will be either by the instrument manufacturer or the U.S. Army Test, Measurement, and Diagnostic Equipment (TMDE) Support Center which supports our region. Calibration is currently provided by the U.S. Army TMDE Support Center - White Sands, White Sands Missile Range, New Mexico 88002-5528.

l. Radiation Protection Program and Teletherapy Program. See ***ATT 1***.

m. Item 10.8 - Radiation Safety Committee. Brooke Army Medical Center currently has a Radiation Safety Committee (known as the Radiation Control Committee) established for license 42-01368-01 (Type A broad scope). The Committee's responsibilities also include teletherapy.

Senior Management. The Radiation Control Committee is chaired by the Deputy Commander (previously Deputy Commander for Clinical Services, or DCCS), second only to the Commanding General in the management structure. The Executive Committee, which is the senior hospital committee, further ensures oversight of licensed activities by the senior management staff.

Management Structure. An organizational chart of BAMC's management structure and reporting channels is at ATT 10.8.1. The RSO and RSO staff is a section of the Preventive Medicine Service.

Charter. An extract of BAMC Memo 15-1, Hospital Boards, Committees, and Councils, dated 31 May 1991, describing the functions of the Executive Committee, is at ATT 10.8.2.

Committee Membership. The identity of Radiation Control Committee members are at ATT 10.8.3. Contrary to BAMC Memo 15-1 (ATT 10.8.2), the Quality Assurance Office is no longer represented on the Radiation Control Committee.

n. Item 10.7 - ALARA Program. See BAMC Memo 40-72, Appendix E (*ATT 1*).

o. Source Change. See survey report dated July 13, 1992, submitted to the NRC.

LIST OF ATTACHMENTS

ATT 1	Brooke Army Medical Center Memorandum No. 40-72 (BAMC Memo 40-72), Ionizing Radiation Protection Program, dated 16 August 1994
ATT 10.5	Operating Procedures
ATT 10.6	Emergency Procedures
ATT 10.8.1	Management Structure, Brooke Army Medical Center
ATT 10.8.2	Extract, BAMC Memorandum No. 15-1, Hospital Boards, Committees, and Councils, dated July 29, 1994.
ATT 10.8.3	Radiation Control Committee membership.

DEPARTMENT OF THE ARMY
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234-6200

BAMC MEMORANDUM
No. 40-72

16 August 1994

Medical Services
IONIZING RADIATION PROTECTION PROGRAM

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*This Memorandum supersedes BAMC Memo 40-72, 17 April 1990

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1. PURPOSE. This memorandum prescribes policies, responsibilities, and administrative procedures for radiation protection to meet Federal and DA regulatory requirements and to keep personnel exposures to ionizing radiation As Low As Reasonably Achievable (ALARA).

2. APPLICABILITY.

a. This memorandum applies to all personnel and activities assigned or attached to Brooke Army Medical Center (BAMC). It also applies to personnel and activities at the Institute of Surgical Research (ISR) with regard to radioactive material used under provisions of licenses and authorizations issued to BAMC by the Nuclear Regulatory Commission (NRC) or Department of the Army (DA).

b. Masculine pronouns used in this memorandum represent both the masculine and feminine genders unless otherwise specifically stated.

3. REFERENCES. References applicable to this memorandum are listed in Appendix A.

4. ABBREVIATIONS AND TERMS. Abbreviations and terms in this memorandum are defined in Appendix B.

5. BACKGROUND. The procurement, ownership, possession, application, and disposal of radioactive material at BAMC and ISR will be only as authorized by existing NRC licenses, DA Radiation Authorizations (DARAs), and/or other applicable regulations. It is the responsibility of all who use or control the use of radioactive material and/or ionizing radiation producing devices to ensure compliance with applicable regulations and this memorandum.

6. RESPONSIBILITIES.

a. Commander. The Commander will:

(1) Control all aspects of the radiation protection program within BAMC and ISR.

(2) Ensure that BAMC possesses the necessary NRC licenses and DARAs for the use of radioactive material.

(3) Provide adequate support for the medical use of ionizing radiation to include:

(a) Accommodations for the clinical care of patients.

(b) Availability of suitably trained and experienced personnel.

(c) Availability of essential equipment such as handling devices, shields, ionizing radiation measuring and monitoring instruments, and radiation protection related publications.

(d) An approved, current, written radiation protection program for the protection of personnel and the health and safety aspects of the use of ionizing radiation.

(4) Designate a qualified RPO and an alternate RPO in writing. Unless found to be unqualified, the Chief and the NCOIC, Health Physics Office, will be the RPO and alternate RPO, respectively.

(5) Designate a Radiation Control Committee (RCC).

(6) Ensure that the qualifications of each individual user of radioactive material within BAMC and ISR, and proposed uses of each radionuclide are reviewed by the RCC according to the requirements specified in the conditions of the applicable NRC license, DARA, and appropriate directives.

(7) Ensure that all individuals working in or frequenting a radiation controlled area are informed of the presence of radiation sources. These individuals will be instructed in precautions and procedures necessary to minimize radiation exposure, and in the biological risks of such exposure.

(8) Sign all application forms for new, or renewal of, NRC licenses and DARAs, and significant amendments.

b. Radiation Control Committee (RCC).

(1) The purpose, composition, and responsibilities of the RCC are contained in BAMC Memorandum No. 15-1. The RCC assists the Commander in the performance of those duties related to the radiation protection program. Specifically, the RCC will:

(a) Meet at least quarterly and at the call of the chairman.

(b) Recommend approval or disapproval of each type of radiation source from the standpoint of radiological health and safety of patients and working personnel and other factors established for the medical use of these sources.

(c) Approve individual users for each type of procedure with each individual radionuclide and ensure that any physician authorized to use radioactive material in humans meets the criteria specified in Part 35, Title 10, Code of Federal Regulations (10 CFR 35). Recommendations will be consistent with the limits and conditions of NRC licenses and DARAs.

(d) Prescribe, if required, special conditions to be permitted in the work area and special procedures or work rules for use of radiation sources.

(e) Review the radiation protection training program.

(f) Monitor radiation exposures within the command and recommend actions to keep exposures ALARA.

(g) Formally review, at least annually, the policies and procedures established to maintain low exposures.

(h) Approve the training and experience of the nuclear pharmacist.

(2) Applications to use ionizing radiation may receive interim approval from the Chairman if approved unanimously by a subcommittee consisting of the RPO, the Chiefs of the Department of Radiology, Nuclear Medicine Service, and Radiation Therapy Service, the Radiopharmacist, and the Teletherapy Physicist. Each member of the subcommittee will review the application as well as the qualifications of the proposed user, and forward any comments and a recommendation for approval or disapproval to the RPO. If the subcommittee unanimously approves the application, the RPO will present the results to the Chairman for interim approval.

c. Radiation Protection Officer. The RPO will be an individual considered qualified by the RCC and approved by the NRC (see paragraph 7, this memorandum, for minimum qualifications of the RPO). The RPO will assist the RCC in the performance its duties. In addition to the responsibilities in 10 CFR 35.21, the RPO will:

(1) Exercise staff supervision over the radiation protection program.

(2) Provide consultation and advice on the degree of hazards associated with radiation and effectiveness of control measures.

(3) Advise and assist the Commander and radiation workers in all matters pertaining to radiation protection, including instructing and training of radiation workers (users) and others in the safe use of protective equipment and sources of ionizing radiation.

(4) Ensure all radioactive material is properly receipted, used, stored, handled, shipped, and disposed of according to applicable directives.

(5) Formulate and implement the radiation protection program.

(6) Formulate, implement, and supervise an active, aggressive, documented program designed to keep radiation doses to levels which are ALARA.

(7) Review current and proposed uses of radiation sources for compliance with regulations and approved procedures.

(8) Review standing operating procedures for operations involving sources of ionizing radiation before submission to the RCC.

(9) Review procurement of all radioactive material to ensure compliance with NRC license and DARA conditions.

(10) Ensure radiation detection and measurement instruments used in radiation protection are properly calibrated and are available to radiation workers.

(11) Ensure all radiation shields, containers, and handling equipment are maintained in satisfactory condition.

(12) Ensure required radiation warning signs are posted.

(13) Ensure that a physical inventory of radioactive material is conducted every 3 months.

(14) Ensure that radiation surveys are performed as prescribed in NRC Regulatory Guide 8.23 and that leak tests are performed semiannually.

(15) Evaluate hazard potential and adequacy of protective measures for existing and proposed operations.

(16) Monitor situations where higher than normal levels of radiation or radioactive contaminants are suspected.

(17) Provide personnel dosimetry services.

(18) Investigate radiation accidents, incidents, and overexposures to determine the cause and take steps to prevent recurrence.

(19) Terminate a program or procedure involving the use of radioactive material or radiation producing devices which are determined to be a threat to health and/or property.

(20) Keep all licenses and DARAs up to date and initiate amendments and requests for renewals when appropriate.

(21) Maintain a current registry of ionizing radiation producing devices, such as x-ray machines.

(22) Provide radioactive waste disposal service.

(23) Review plans for design or modification of diagnostic x-ray, therapeutic x-ray and gamma-beam therapy facilities and other facilities where ionizing radiation sources are used or stored.

(24) Perform annual radiation protection surveys of x-ray systems and other sources of machine-produced radiation in accordance with TB MED 521.

(25) Provide health physics support to DENTAC, ISR and the Military Enlistment Processing Station (MEPS), San Antonio.

(26) Maintain a health physics reference library.

d. Activity Radiation Protection Officer (ARPO). An ARPO may be designated in writing for an activity, and will be designated in writing for each activity that uses radioactive material. This person will have sufficient authority, training and experience to perform the duties of an ARPO. Within each activity, the ARPO will:

(1) Be a point of contact for the RPO.

(2) Under the guidance and supervision of the RPO, implement the radiation protection program set forth in this memorandum and other applicable directives.

e. Physician-users. Physician-users are physicians authorized by the RCC to use radioactive material in or on humans for diagnostic, therapeutic, or investigational purposes. Physician-users may delegate responsibilities to physicians under their direct supervision. "Supervision" means that the physician-user has provided adequate instructions to the physician(s) in specific areas of human use and has ascertained that they are receiving training in the safe use of radioactive material in or on humans. It also means that the physician-user periodically reviews the work of those supervised by him and ensures that proper medical records are created and maintained for each use.

(1) Under the direct supervision of the physician-user, another physician may be authorized to:

(a) Approve procedures involving the administration of radiopharmaceuticals or ionizing radiation to patients.

(b) Prescribe radiopharmaceuticals, to include the route of administration and dose of each radiopharmaceutical, or source of ionizing radiation to be administered.

(c) Interpret results from diagnostic procedures involving radiopharmaceuticals.

(2) Physician-users may authorize qualified paramedical personnel to:

(a) Prepare and quality control test radiopharmaceuticals and sources of ionizing radiation.

(b) Measure radiopharmaceutical doses prior to administration.

(c) Use appropriate instrumentation for the collection of data to be used by the physician.

(d) Administer radiopharmaceuticals and radiation to patients. However, paramedical personnel will not administer therapeutic doses of radiation or radioactive material unless a physician-user or physician under the direct supervision of a physician-user is in attendance.

(3) Physician-users may delegate the following to credentialed nuclear pharmacists approved by the RCC:

(a) Prescribe radiopharmaceuticals and doses to be administered and determine the route of administration.

(b) Prepare and administer radiopharmaceuticals.

(c) Maintain quality assurance of radiopharmaceuticals and instrumentation used within the nuclear pharmacy.

(d) Measure the radiopharmaceutical activity prior to administration.

f. Each activity chief and/or NCOIC will:

(1) Ensure that all radiation workers within the activity receive appropriate training to maintain proficiency in their specialty field. In addition, radiation workers will receive an initial radiation safety briefing specific to their work environment and will attend annual radiation safety training provided by the Health Physics Office.

(2) Maintain records of all training.

(3) Ensure all radiation workers inprocess at the Health Physics Office with their medical records and previous exposure history, and outprocess at the Health Physics Office upon termination of duties requiring occupational exposure to ionizing radiation.

(4) Ensure dosimeters are worn when personnel enter or work in radiation areas. Supervisors will also ensure that dosimeters are stored properly when not being used.

(5) Refer declared pregnant radiation workers to the RPO for a radiation safety consultation.

g. All authorized users will:

(1) Use ionizing radiation sources only in accordance with stipulations of BAMC RCC authorizations (see paragraph 9, this memorandum) and applicable regulations.

(2) Have primary responsibility for ensuring that persons under their supervision receive radiation safety training appropriate for their jobs.

(3) Report violations or suspected violations of applicable radiation safety directives to the RPO.

(4) Provide radiologically safe work environments for personnel under their supervision.

h. Radiation workers will:

(1) Work in a radiologically safe manner to protect themselves, other employees, patients and the general public from exposure to radiation.

(2) Report radiologically unsafe working conditions to supervisors or the RPO.

(3) Provide off-duty occupational radiation exposure information to the RPO at least once per calendar quarter.

7. QUALIFICATIONS OF THE RADIATION PROTECTION OFFICER.

a. The RPO is the individual designated as the radiation safety officer on NRC licenses issued to BAMC.

b. The individual designated as the RPO on any application to the NRC will satisfy the minimum qualifications given in 10 CFR 35.900 unless that individual was identified as the radiation safety officer on an NRC or Agreement State license before 1 October 1986 (10 CFR 35.901). The RPO will be an individual who:

(1) Is certified by the:

(a) American Board of Health Physics in Comprehensive Health Physics;

(b) American Board of Radiology;

(c) American Board of Nuclear Medicine;

(d) American Board of Science in Nuclear Medicine; or

(e) Board of Pharmaceutical Specialties in Nuclear Pharmacy; or

(2) Has had classroom and laboratory training and experience as follows:

(a) 200 hours of classroom and laboratory training that includes:

- Radiation physics and instrumentation;

- Radiation protection;

- Mathematics pertaining to the use and measurement of radioactivity;

- Radiation biology; and

- Radiopharmaceutical chemistry; and

(b) one year full time experience as a radiation safety technologist at a medical institution under the supervision of the individual identified as the radiation safety officer on an NRC or Agreement State license that authorizes the medical use of byproduct material; or

(3) Is an authorized user identified on the NRC license.

8. EXCEPTIONS. Exceptions to this memorandum may be granted by the RPO provided that such exceptions do not endanger personnel or property and do not violate Federal regulations, or NRC license or DARA conditions. An exception granted by the RPO will be reviewed by the RCC at its next meeting.

9. AUTHORIZATIONS TO USE IONIZING RADIATION SOURCES.

a. General.

(1) Radioactive material at BAMC is held, used and disposed of in accordance with applicable Federal and DA regulations and under terms of NRC licenses and DARAs. The BAMC RCC has been delegated authority by the NRC and Office of the Surgeon General (OTSG) to approve uses and users of radioactive material within regulatory limits.

(2) The RCC has also been delegated authority to approve uses and users of other ionizing radiation sources (e.g., x-ray systems, electron microscopes). Use and user approval authority for ionizing radiation sources other than radioactive material, orthovoltage x-ray therapy systems and the linear accelerator, is delegated to supervisors with review by the RCC as it deems necessary.

(3) Physicians authorized by the RCC to perform teletherapy under 10 CFR 35.600 are authorized to use the orthovoltage x-ray therapy system and the linear accelerator.

b. Obtaining authorization to use ionizing radiation. The Health Physics Office will provide forms and assistance to applicants.

(1) For human use, each applicant will provide the following to the RPO:

(a) A memorandum requesting authorization to use radioactive material (or ionizing radiation generated by machine sources if the use is for research purposes). The memorandum will specify each radionuclide or each class of radionuclides to be used, and the type of use.

(b) NRC Supplement A, Training and Experience - Authorized User or Radiation Safety Officer. Submit one form for each applicant named on the memorandum.

(c) NRC Supplement B, Preceptor Statement. Submit one form for each applicant named on the memorandum.

(d) Protocol. See Appendix B, TB MED 525, for guidance in preparing protocols for nonroutine human use of radioactive material. A protocol generally will not be required for those uses of radioactive material listed in 10 CFR Parts 35.100, 35.200, 35.300, 35.400, 35.500, or

35.600, or for routine human use of the orthovoltage x-ray therapy system or the linear accelerator.

(2) For other than human use, each applicant will provide the following to the RPO:

(a) A memorandum requesting authorization to use radioactive material. The memorandum will specify each radionuclide to be used, the type of use, and location(s) of use.

(b) NRC Supplement A, Training and Experience - Authorized User or Radiation Safety Officer. Submit one form for each applicant named on the memorandum.

(3) The RPO will, in the order listed:

(a) Review the application for completeness and radiation protection adequacy.

(b) Request additional information and survey the proposed facilities, as necessary.

(c) Make copies of the completed application and distribute them to the RCC members for their review prior to the next RCC meeting.

(4) The RCC will, in the order listed:

(a) Evaluate the application with regard for completeness, radiation protection adequacy, and training and experience of the authorized users. Protocols will be evaluated to determine medical acceptability of procedures with regard to personnel exposures. Protocols involving the use of human subjects as volunteers will also be evaluated by the Institutional Review Board (see BAMC Memo 15-1).

(b) Use the criteria in Appendix C to evaluate the adequacy of radiological facilities identified in an application for other than human use of radioactive material.

(c) Approve or disapprove the application. If approved, an authorization will be issued using BAMC Form 1056-E (Figure 1).

c. Amendments. Before an authorized user may deviate from uses and procedures approved by the RCC, he will obtain an amendment to the authorization by submitting documentation to the RPO that adequately describes the proposed changes. Procedures in paragraphs 9b(3) and (4), this memorandum, will then be followed.

d. Annual review. The RPO will review current authorizations at least annually. The results of this review, to include recommendations for renewal, cancellation, or amendment, will be presented to the RCC.

e. Acceptable training and experience for human use of radioactive material listed in 10 CFR 35 are as follows:

(1) For uses listed in 10 CFR 35.100 (Use of radiopharmaceuticals for uptake, dilution, & excretion studies), acceptable training and experience is given in 10 CFR 35.910.

(2) For uses listed in 10 CFR 35.200 (Use of radiopharmaceuticals, generators, and reagent kits for imaging & localization studies), acceptable training and experience is given in 10 CFR 35.920.

(3) For uses listed in 10 CFR 35.300 (Use of radiopharmaceuticals for therapy), acceptable training and experience is given in 10 CFR 35.930, 10 CFR 35.932, and 10 CFR 35.934.

(4) For uses listed in 10 CFR 35.400 (Use of sealed sources for brachytherapy), acceptable training and experience is given in 10 CFR 35.940 and 10 CFR 35.941.

(5) For uses listed in 10 CFR 35.500 (Use of sealed sources for diagnosis), acceptable training and experience is given in 10 CFR 35.950.

(6) For uses listed in 10 CFR 35.600 (Use of a sealed source in a teletherapy unit), acceptable training and experience is given in 10 CFR 35.960.

(7) Acceptable training and experience for the teletherapy physicist is given in 10 CFR 35.961.

f. For other than human use, an individual applying for approval to use radioactive material will have the following training and experience:

(1) 40 hours of classroom and laboratory training that includes:

(a) Radiation physics and instrumentation.

(b) Radiation Protection.

(c) Mathematics pertaining to the use and measurement of radioactivity.

(d) Radiation biology.

(2) 20 hours of laboratory experience under the supervision of an authorized user which includes:

(a) Ordering, receiving, and unpacking radioactive material safely, and performing the related radiation surveys.

(b) Performing laboratory radiation safety surveys.

(c) Performing checks for proper operation of survey meters.

(d) Using procedures to contain spilled byproduct material safely and using proper decontamination procedures.

(e) Maintaining running inventories of radioactive material on hand.

g. At its discretion, the RCC may grant an exception to documenting all or part of the training and experience requirements indicated in paragraph 9f, this memorandum, for an individual applying for approval to use radioactive material for other than human use if that individual was previously an approved user under an NRC license or DARA issued to BAMC or other activity.

h. Radioactive calibration and reference standards. Authorized users are authorized use of sealed sources up to 3 millicuries as calibration or reference standards.

10. PERSONNEL DOSIMETRY.

a. Occupational ionizing radiation dose limits, and ionizing radiation dose limits for individual members of the public, are described in Appendix D.

b. Thermoluminescent dosimeters (TLDs) to monitor occupational doses from ionizing radiation will be issued by the Health Physics Office as follows:

(1) A whole-body TLD will be issued to each person who is likely to exceed, from sources external to the body, 10 percent of the applicable dose limits in Appendix D. In addition, anyone who is issued a head & neck TLD or an extremity TLD will also be issued a whole-body TLD.

(2) A head & neck TLD will be issued to each person who is likely to exceed, from sources external to the body, 10 percent of the applicable dose limits in Appendix D, and has a lead-lined protective vest available for use. Such individuals normally work with fluoroscopy.

(3) To monitor extremity doses, a ring TLD will be issued to each person who is likely to exceed, from sources external to the body, 10 percent of the applicable dose limits in Appendix D.

(4) Other persons not included in the above stated guidelines may be issued personnel dosimeters at the discretion of the RPO.

c. Activities which routinely receive personnel dosimetry service from the Health Physics Office will designate primary and alternate dosimetry coordinators. Dosimetry coordinators will:

(1) Collect all TLDs in their activity at the end of the designated TLD wearing period, exchange them for new ones at the Health Physics Office, and issue the new TLDs within their activity.

(2) Ensure that radiation workers newly assigned to the activity inprocess at the Health Physics Office before assuming duties which entail occupational exposure to ionizing radiation.

(3) Notify the Health Physics Office when a radiation worker is going to terminate employment in the activity.

(4) Update rosters provided by the Health Physics Office.

(5) Issue quarterly dosimetry reports to radiation workers (provided by the Health Physics Office).

d. Dosimeter Wearing Periods.

(1) Activities that use radioisotopes (other than carbon-14, tritium or small quantities of iodine-125), or perform extensive radiography and/or fluoroscopy, will be issued new TLDs on a monthly basis.

(2) Activities (other then those described in the previous paragraph) that historically receive less than 10 percent of the applicable dose limits will be issued TLDs on a quarterly basis.

e. BAMC-issued personnel dosimeters will not be worn at facilities other than BAMC, ISR, DENTAC (Fort Sam Houston), or MEPS (San Antonio), except as authorized by the RPO.

f. Radiation workers will not wear personnel dosimetry devices while undergoing medical or dental diagnostic or therapeutic treatment with ionizing radiation.

g. Personnel beginning or ending dosimetry service at BAMC will report to the Health Physics Office during normal duty hours with their medical records for processing.

11. RADIOBIOASSAY PROGRAM. Due to their chemical or physical form or the manner in which they are handled, intakes of some radioactive material may occur, e.g., by inhalation or ingestion. Concentrations of radioactive material in air or work areas, quantities of radionuclides in the body, quantities of radionuclides excreted from the body, or a combination of these, will be measured in a suitable and timely manner to assess internal exposures to radioactive material. In BAMC and ISR, only measurable intakes of radioiodine are possible under normal circumstances.

a. A radiobioassay area is defined herein as an area where unsealed iodine-125 or iodine-131 is processed in the following quantities at any one time or over a 3 month period:

(1) 100 or more microcuries if in a volatile or dispersible form.

(2) 1 millicurie or more if bound to a nonvolatile agent.

b. The types and frequency of bioassays are as follows:

(1) Baseline - a preemployment/preoperational radiobioassay conducted on all newly assigned radiation workers who will work in radiobioassay areas.

(2) Initial - a radiobioassay performed not earlier than 24 hours nor later than 72 hours following entry into a radiobioassay area.

(3) Biweekly - a radiobioassay initiated 2 weeks after the initial radiobioassay, and performed thereafter at 2-week intervals.

(4) Quarterly - a routine radiobioassay performed once per quarter. A radiation worker in a radiobioassay area will be placed on a quarterly radiobioassay schedule if the following conditions are met:

(a) The individual did not have a measured thyroid burden exceeding minimum detectable activity (MDA) during the period of initial and biweekly bioassays.

(b) The potential for internal exposure to radioiodine during the period of initial and biweekly bioassays was representative of normal working conditions in the radiobioassay area.

(5) Therapy - a radiobioassay performed not earlier than 24 hours nor later than 72 hours on each radiation worker involved in the preparation and/or administration of a single amount of iodine-131 exceeding 100 microcuries.

(6) Emergency - a radiobioassay performed as soon as possible after an intake that may exceed 10 percent of the annual limit on intake (ALI).

c. All radiation workers in radiobioassay areas will participate in the radiobioassay program. The RPO will identify radiobioassay areas and ensure that radiation workers from those areas receive bioassays at appropriate intervals. Bioassays will be performed using in vivo methods.

(1) Radiation workers in iodine-125 radiobioassay areas will receive baseline, initial, biweekly, and quarterly bioassays as described above, and emergency bioassays when required.

(2) Radiation workers in iodine-131 radiobioassay areas will receive baseline, initial, biweekly, therapy, and quarterly bioassays as described above, and emergency bioassays when required.

d. Results of bioassays will be forwarded by the Health Physics Office to the Ionizing Radiation Dosimetry Center (IRDC) in Lexington, Kentucky for inclusion in the radiation workers' dosimetry records.

12. PROTECTION OF THE EMBRYO/FETUS.

a. The radiation dose to the embryo/fetus due to occupational exposure of a declared pregnant woman will not exceed 0.5 rem during the entire pregnancy. The dose to an embryo/fetus will be taken as the sum of the deep-dose equivalent to the declared pregnant woman and the dose to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

b. It is the pregnant radiation worker's responsibility to notify the RPO about her pregnancy as soon as possible. The RPO will schedule a consultation with the pregnant radiation worker to review her radiation exposure history and exposure potential, inform her of the biological effects and risks from ionizing radiation exposure to the embryo/fetus, and provide her a copy of NRC Regulatory Guide 8.13. The RPO will then refer her to Occupational Health.

c. No later than 5 working days following consultation with the pregnant radiation worker, the RPO will notify her supervisor in writing that the required consultation has taken place, and of any additional measures that may be necessary to ensure that the dose limit to the embryo/fetus is not exceeded.

d. The supervisor of the pregnant radiation worker will make every reasonable effort to prevent doses above 0.05 rem per month to the embryo/fetus.

13. GENERAL RULES FOR SAFE USE OF RADIOACTIVE MATERIAL. Radiation workers will adhere to the following rules for handling radioactive material.

a. Wear laboratory coats or other protective clothing at all times in areas where radioactive material is used.

b. Wear disposable gloves at all times while handling radioactive material.

c. Either after each procedure or before leaving the area, monitor your hands for contamination in low-background area with a GM Counter.

d. Use syringe shields for routine preparation of multi-dose vials and administration of radiopharmaceuticals to patients, except in those circumstances in which their use is contraindicated (e.g., recessed veins, infants). In these exceptional cases, consider the use of other protective methods such as remote delivery of the dose (e.g., through use of a butterfly valve).

e. Do not eat, drink, smoke, or apply cosmetics in any area where radioactive material is stored or used.

f. Do not store food, drink, or personal effects in areas where radioactive material is stored or used.

g. Wear personnel monitoring devices (i.e., TLDs) at all times while in areas where radioactive material is used or stored. These devices will be worn as prescribed by the Radiation Safety Officer. When not being worn to monitor occupational exposures, personnel monitoring devices should be stored in the work place in a designated low-background area.

h. Wear a finger exposure monitor during the elution of generators; during the preparation, assay, and injection of radiopharmaceuticals; and when holding patients during procedures.

i. Dispose of radioactive waste only in designated, labeled, and properly shielded receptacles.

j. Never pipette by mouth.

k. Confine radioactive solutions in shielded containers that are clearly labeled. Radiopharmaceutical multidose diagnostic vials and therapy vials should be labeled with the isotope, the name of the compound, and the date and time of receipt or preparation. A log book should be used to record the preceding information and total prepared activity, specific activity as millicuries per cubic centimeter at a specified time, total volume remaining, the measured activity of each patient dosage, and any other appropriate information. Syringes and unit dosages should be labeled with the radiopharmaceutical name or abbreviation, type of study, or the patient's name.

l. Assay each patient dosage in the dose calibrator before administering it. Do not use a dosage if it is more than 10 percent off from the prescribed dosage, except for prescribed dosages of less than 10 microcuries. When measuring the dosage, you need not consider the radioactivity that adheres to the syringe wall or remains in the needle. Check the patient's name and identification number and the prescribed radionuclide, chemical form, and dosage before administering.

m. Always keep flood sources, syringes, waste, and other radioactive material in shielded containers.

14. ALARA PROGRAM. Procedures for maintaining occupational radiation exposure at BAMC and ISR ALARA (As Low As Reasonably Achievable) are described in Appendix E.

15. REPORTING OF DEFECTS AND NONCOMPLIANCE. This paragraph implements the requirements of 10 CFR 21.

a. Any individual who obtains information reasonably indicating either of the following will immediately notify his supervisor who, in turn, will notify the RPO:

(1) A facility, activity, or basic component supplied to BAMC or ISR fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or NRC license relating to substantial hazards.

(2) A facility, activity, or basic component supplied to BAMC or ISR contains defects, which could create a substantial safety hazard.

b. The RPO will conduct an investigation of the defect or failure to comply. If the reported defect or failure to comply is found to be valid, the RPO will provide a preliminary report and a final report to the NRC within 2 days and 60 days, respectively, after receipt of the notification.

16. CALIBRATION OF RADIATION SURVEY METERS. The RPO will ensure that all survey meters are calibrated at least once every 12 months. Army requirements for survey meter calibration are in TB 43-180.

17. ACCOUNTABILITY AND INVENTORY OF IONIZING RADIATION SOURCES. The RPO is responsible for the physical inventory and accountability of all radioactive material and ionizing radiation producing devices in accordance with the provisions of Federal and DA regulations. The RPO will ensure that the total inventory of radioisotopes on hand at any one time does not exceed the possession limits indicated in the applicable NRC license or DARA. To accomplish this, the RPO will assign maximum possession limits to activities that use radioactive material.

a. Each ARPO will:

(1) Ensure that the total inventory of any radioisotope on hand at any time in his activity does not exceed the maximum possession limits assigned by the RPO.

(2) Maintain a current inventory of radioactive material within his activity.

(3) Conduct a physical inventory quarterly under the supervision of the Health Physics Office.

(4) Within 5 days after the end of each calendar quarter, submit a written report to the RPO that lists the amount of each radionuclide received, used, and disposed of during the calendar quarter, and the amount on hand at the end of the quarter.

b. Devices that produce ionizing radiation or contain sealed radioactive sources will be registered with the Health Physics Office. When devices containing sealed radioactive sources are received, the gaining hand receipt holder will inform his ARPO to update the source inventory. ARPOs will forward the information to the RPO. The RPO will physically inventory these devices semiannually.

18. PROCEDURES FOR ORDERING RADIOACTIVE MATERIAL.

a. Only activities authorized by the RCC to use radioactive material may submit a purchase request for radioisotopes. The RPO will provide to Logistics Division a list of activities authorized to purchase radioactive material. The list will include the radionuclides and corresponding maximum amounts that each activity can order at any one time. The RPO retains the authority to approve purchase requests for radioactive material prior to purchase.

b. A system for ordering radioactive material will be established and maintained by each activity.

(1) For routinely used material, the system will include written records that identify the isotope, chemical form, activity, and supplier. These records will be annotated when opening or storing a radioactive shipment. Copies of all ordering and receiving documents will be maintained.

(2) For occasionally used material (e.g., therapeutic uses), the system will include a written request from the physician who will perform the procedure. In the case of special orders, the physician's written request and appropriate shipping/receiving records will be referenced and the dose assayed prior to its administration. Persons ordering the material will reference the physician's written request when placing an order. The physician's request will indicate isotope, compound, activity level, etc. The physician's written request will be referenced when receiving, opening, or storing the radioactive material. Copies of all ordering and receiving documents will be maintained.

19. PROCEDURES FOR RECEIVING AND SAFELY OPENING PACKAGES OF RADIOACTIVE MATERIAL.

a. Only the Health Physics Office, Nuclear Medicine Service, Department of Clinical Investigations, Department of Pathology and Area Laboratory Service, Institute of Surgical Research and Radiation Therapy Service are authorized to receive packages from shippers. In the event a package is erroneously delivered to and accepted by Logistics Division, the receiving area

supervisor will immediately notify the addressee (during normal working hours) or the AOD (after normal working hours). The addressee will be responsible for obtaining the packages and complying with the provisions of this paragraph and Appendix F.

b. See Appendix F for procedures for receiving and safely opening packages of radioactive material. Users will contact the RPO about interpretations of 10 CFR 20.1906 and this paragraph, whenever in doubt, to preclude violations of applicable regulations.

20. SHIPMENTS OF RADIOACTIVE MATERIAL. Shipments of radioactive material held under authority of NRC general or specific licenses or DARAs are not authorized without prior concurrence of the RPO. The RPO will ensure that the shipper complies with all applicable directives before dispatch of the shipment is permitted.

21. TRANSFER OF RADIOACTIVE MATERIAL BETWEEN ACTIVITIES.

a. Except for prepared individual diagnostic doses, all transfers between activities will have prior approval of the RPO. BAMC Form 1055 (see Figure 2) will be used to document transfers and will be initiated at the facility where the material to be transferred is located. Appropriate changes to inventories will be made by the ARPO.

b. The activity from which the transfer is made will ensure that appropriate precautions are taken. The RPO will provide guidance as necessary.

c. A radiation detection survey meter will be carried in the vehicle when transferring radioactive material.

d. Normally, 2 persons will accompany any radioactive material during its movement. In case of an accident or spill, one person will stay with the material to protect the public while the other notifies the RPO and takes other appropriate action. The activity from which the transfer is made will be responsible for decontamination, to be performed under the supervision of the RPO.

22. DISPOSAL OF RADIOACTIVE WASTE.

a. Release to the sanitary sewerage system.

(1) No radioactive material will be released into the sanitary sewerage system unless it is readily soluble or dispersible in water and approval has been given by the RPO. In granting approval for release into the sanitary sewerage system, the RPO has sole authority to:

(a) Designate the sinks to be used. These sinks will be designated as "hot sinks" and will be appropriately labeled and marked as indicated by the RPO. The ARPO will notify the RPO before permitting maintenance or repair on a hot sink.

(b) Prescribe daily, monthly and annual disposal limits on the amount and types of radioactive waste disposed of by release to the sanitary sewerage system.

(2) The using activity will maintain a record (e.g., log book) for each hot sink identifying the dates and radionuclides disposed, cumulative activity for the month and calendar year for each radionuclide disposed in each hot sink, and identification (i.e., initials) of the person making the disposal. The record will remain near the hot sink for easy access by both disposing activity personnel and the RPO. Upon removal from active use, the record will be forwarded to the RPO for filing.

(3) Excreta from patients undergoing medical diagnosis or therapy with radioactive material, such as iodine-131 radiotherapy treatment of thyroid disease, are exempt from the limitations of 10 CFR 20.2003 to the extent they are disposed of in the sanitary sewerage system. However, spills or incontinence may result in radioactive contamination which will be carefully and adequately cleaned up. Also, laboratory samples from such patients will be treated as radioactive material. The RPO will be consulted in such circumstances.

b. Release of airborne radioactive material to unrestricted areas.

(1) No airborne radioactive material will be released to unrestricted areas without approval from the RPO. The RPO will not grant approval unless compliance with 10 CFR 20.1302 can be demonstrated.

(2) The RPO will ensure that, at intervals not to exceed 6 months, ventilation surveys are conducted in all areas where radioactive gases are used. Ventilation surveys are normally performed by the Industrial Hygiene Section, Preventive Medicine Service.

c. Other radioactive waste. The Health Physics Office will operate a radioactive waste disposal service for waste that is not disposed of as specified in paragraphs 22a and 22b, this memorandum.

(1) Periodically, Health Physics personnel will pick up packaged radioactive waste from authorized users and activities.

(2) Authorized users and activities are responsible for:

(a) Segregating and properly packaging radioactive waste.

(b) Identifying the contents of the waste, to include radioisotope, approximate activity, and date packaged.

(c) Completing BAMC Form 1055 (Figure 2).

(3) Radioactive waste collected by the Health Physics Office will either be held for decay until it can be disposed of as biohazardous waste or held until transferred to a radioactive waste disposal site.

23. EMERGENCY PROCEDURES FOR SPILLS. See Appendix G. Authorized users will include spill procedures in their SOPs. The SOPs will also contain the office telephone number of the Health Physics Office (916-7181/7494) and instructions to notify the AOD (916-6141) after duty hours to contact the RPO.

24. LEAK TESTING SEALED SOURCES. The RPO is responsible for performing leak testing of sealed sources. (see Appendix H for leak test procedures)

a. Each sealed source and detector cell which contains only beta and/or gamma emitting material will be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.

b. Each sealed source and detector cell which contains alpha emitting material will be tested for leakage and/or contamination at intervals not to exceed 3 months.

c. In the absence of a certificate from a transferrer indicating that a leak test has been made within 6 months prior to the transfer (3 months for alpha sources), a sealed source or detector cell received from another person will not be put into use until tested.

d. Each sealed source fabricated within BAMC or ISR will be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.

e. A sealed source need not be leak tested if any of the following apply:

(1) The sealed source contains only hydrogen-3.

(2) The sealed source contains only a radioactive gas.

(3) The half-life of the radioisotope is 30 days or less.

(4) The sealed source contains not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material.

(5) The sealed source is not designed to emit alpha particles, is in storage, and is not being used. However, when any such source is removed from storage for use or transferred to another person and has not been tested within the required leak test interval, the source will be tested before use or transfer. Additionally, no sealed source or detector cell will be stored for a period of more than 10 years without being tested for leakage and/or contamination.

f. Each leak test will be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination:

(1) The source will be removed immediately from service and stored in accordance with the requirements of 10 CFR 20 and 10 CFR 30.

(2) A report will be filed with the NRC in accordance with 10 CFR 35.59(e)(2). The report will be filed within 5 days of the date the leak test result is known with NRC Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Radiation Safety and Safeguards, with a copy to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555. The report will describe the source/equipment involved, the test results, and action taken.

g. Tests for leakage and/or contamination will be performed by the RPO or by other persons specifically licensed by the NRC or an Agreement State to perform such services.

25. AREA SURVEY PROCEDURES (RADIOACTIVE MATERIAL).

a. Nuclear Medicine will survey, at the end of each day of use, all areas where radiopharmaceuticals are routinely prepared for use or administered (i.e., all elution, preparation and injection areas). Surveys will include measurements of dose rates.

b. The Health Physics Office will survey:

(1) At least once each week, all areas where radiopharmaceuticals are routinely prepared for use, administered, or stored (i.e., all elution, preparation, injection, imaging, storage, and waste holding areas). Surveys will include measurements of dose rates and removable contamination.

(2) At least once each month, all laboratory areas where only small quantities of radioactive material other than radiopharmaceuticals are used (e.g., radioimmunoassay, in vitro testing). These areas include, but are not limited to, Clinical Investigation, DPALS, ISR, and Radioimmunoassay. Surveys will include measurements of dose rates and removable contamination.

(3) At least once each month, all areas where only sealed radioactive sources are used. Surveys will include measurements of dose rates.

(4) At least once each quarter, all unrestricted areas adjacent to radiation/restricted areas. Surveys will include measurements of dose rates in both indoor and outdoor areas, and removable contamination in indoor areas.

c. Survey instrument capabilities.

(1) Each survey that includes measurements of dose rates will be performed with a radiation detection survey instrument capable of detecting dose rates as low as 0.1 millirem per hour.

(2) Each survey that includes measurements of removable contamination will be performed with radiation detection instrumentation capable of measuring contamination on each wipe sample of 100 disintegrations per minute.

d. The record of each survey required by paragraphs 25a and 25b(1)-(4), this memorandum, will be retained for 3 years, and will include the date of the survey, a plan of each area surveyed, the dose rate and removable contamination trigger levels established for each area, the measured dose rate at several points in each area expressed in millirem per hour, the removable contamination in each area expressed in disintegrations per minute per 100 square centimeters, identification of the instruments used to perform the survey or analyze the samples (to include model number, serial number, and date of calibration), corrective action taken in the case of contamination or excessive exposure rates, and the initials or signature of the individual who performed the survey. If any dose rate exceeds a trigger level, the individual performing the survey will immediately notify the RPO.

e. Dose rate and removable contamination trigger levels are listed in Appendix I.

f. The user who causes contamination is responsible for decontamination. The Health Physics Office will provide supervision and assistance as necessary.

26. RADIOPHARMACEUTICALS. The Chief, Nuclear Medicine Service, has primary responsibility for the preparation and dispensing of radiopharmaceuticals intended for use in humans. The radiopharmacist is responsible to the Chief, Nuclear Medicine Service, for the preparation, manufacture and dispensing of radiopharmaceuticals. Radiopharmaceuticals will be prepared in accordance with accepted pharmacy practice, as determined by the radiopharmacist and approved by the RCC.

a. Only the Nuclear Medicine Service will manufacture, prepare and dispense radiopharmaceuticals intended for administration to humans. Radiopharmaceuticals compounded at BAMC will not be used in or on humans until their pharmaceutical quality and assay have been established. They will not be dispensed except for use at BAMC by users approved by the RCC.

b. The radiopharmacist, in collaboration with the Chief, Nuclear Medicine Service, will establish specific procedures for the compounding of each radiopharmaceutical. The procedure will be approved by the RCC.

27. HEALTH PHYSICS ASPECTS OF PATIENT CARE

a. The RPO is responsible for providing health physics support during therapeutic administrations of radioactive material or the radiation therefrom (except teletherapy) which require hospitalization. When a therapy procedure is scheduled, the service administering the therapy (i.e., Nuclear Medicine, Radiation Therapy) will notify the RPO as soon as possible, preferably not later than 72 hours prior to the therapy. The following information will be provided at the time the RPO is notified: Patient's name, radionuclide and millicurie amount, date and time of administration, method of administration (i.e. oral, implant), referring physician's name and administering physician's name.

b. Patients containing more that 30 millicuries of iodine-131 or gold-198 will not be discharged until the highest measured dose rate from the patient is less than 5 millirems per hour at 1 meter from the patient.

c. Patients undergoing brachytherapy will not be released until all sources have been removed (if implanted with sources having a half-life longer than 125 days), or until the exposure rate at 1 meter is less than 5 millirems per hour (if implanted with sources having a half-life shorter than 125 days).

d. Inpatients undergoing radiopharmaceutical therapy with more than 30 millicuries of iodine - 131 or brachytherapy will be hospitalized in a private room with private sanitary facilities. Only rooms approved by the RPO may be used. Normally, therapy rooms will be located as far away from the nursing station and heavy traffic hallways as practicable, and will be uncarpeted if used for radiopharmaceutical therapies.

e. Radiation safety procedures for radiopharmaceutical therapies. See Appendix J.

f. Radiation safety procedures for brachytherapy. See Appendix K.

28. QUALITY IMPROVEMENT. Selected aspects of the radiation protection program administered by the Health Physics Office will be monitored as part of the BAMC Preventive Medicine Service quality improvement program.

APPENDIX A

References

1. AR 40-5, Preventive Medicine.

2. AR 40-14, Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials.

3. AR 385-11, Ionizing Radiation Protection (Licensing, Control, Transportation, Disposal, and Radiation Safety).

4. Title 10, Code of Federal Regulations (CFR), Chapter 1 - Nuclear Regulatory Commission.

5. U.S. Nuclear Regulatory Commission (NRC) Regulatory Guides (RG).

   a. NRC RG 8.7, Instructions for Recording and Reporting Occupational Radiation Exposure Data.

   b. NRC RG 8.9, Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program.

   c. NRC RG 8.13, Instruction Concerning Prenatal Radiation Exposure.

   d. NRC RG 8.20, Applications of Bioassay for I-125 and I-131.

   e. NRC RG 8.23, Radiation Safety Surveys at Medical Institutions.

   f. NRC RG 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses.

   g. NRC RG 8.36, Radiation Dose to the Embryo/Fetus.

   h. NRC RG 8.37, ALARA Levels for Effluents from Materials Facilities.

   i. NRC RG 10.8, Guide for the Preparation of Applications for Medical Use Programs.

6. TB 43-180, Calibration and Repair Requirements for the Maintenance of Army Material.

7. TB MED 521, Management and Control of Diagnostic X-Ray, Therapeutic X-Ray, and Gamma-Beam Equipment.

8. TB MED 525, Control of Hazards to Health From Ionizing Radiation Used by the Army Medical Department.

APPENDIX B

Explanation of Abbreviations and Terms

1. Abbreviations.

a. ALARA. As Low As Reasonably Achievable

b. ALI. Annual Limit on Intake

c. AOD. Administrative Officer of the Day

d. ARPO. Activity Radiation Protection Officer

e. Bq. Becquerel

f. Ci. Curie

g. DA. Department of the Army

h. DAC. Derived air concentration

i. DARA. Department of the Army Radiation Authorization

j. DOE. U.S. Department of Energy

k. DOT. U.S. Department of Transportation

l. DPALS. Department of Pathology and Area Laboratory Service

m. Gy. Gray

n. HPO. Health Physics Office

o. IL. Investigational Level

p. ISR. U.S. Army Institute of Surgical Research

q. MDA. Minimum Detectable Activity

r. MEPS. Military Enlistment Processing Station

s. NCOD. Noncommissioned Officer of the Day

t. NRC. U.S. Nuclear Regulatory Commission

u. RCC. Radiation Control Committee (term used by the Army and BAMC for the Radiation Safety Committee)

v. RPO. Radiation Protection Officer (term used by the Army and BAMC for the Radiation Safety Officer)

w. RSC. Radiation Safety Committee (the term used by the NRC for the Radiation Control Committee)

x. RSO. Radiation Safety Officer (the term used by the NRC for the Radiation Protection Officer)

y. SI. International System of Units (Le Système International d'Unités)

z. Sv. Sievert

aa. TLD. Thermoluminescent Dosimeter

2. Terms. Terms used in radiation protection which are not defined in this memorandum can be found in AR 40-14 and TB MED 525.

a. Absorbed dose. The energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the rad and the gray (Gy).

b. Activity.

(1) The rate of disintegration (transformation) or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq).

(2) Department, division, service, section, office, building, area, etc.

c. Adult. An individual 18 or more years of age.

d. Airborne Radioactive Material. Radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.

e. Airborne Radioactivity Area. A room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations-

(1) In excess of the derived air concentrations (DACs) specified in Appendix B, 10 CFR 20.1001-20.2401, or

(2) To such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.

f. ALARA (acronym for "as low as is reasonably achievable"). ALARA means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this memorandum as is practical and consistent with the purpose for which the licensed activity is undertaken, taking into account the state of

technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of licensed materials in the public interest.

g. Annual Limit on Intake (ALI). The derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 5 rems (0.05 Sv), or a committed dose equivalent of 50 rems (0.5 Sv) to any individual organ or tissue. (ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table 1, Columns 1 and 2, of Appendix B to 10 CFR 20.1001-20.2401.

h. Authorization. A document indicating RCC approval of an authorized user and authorized use(s) of ionizing radiation.

i. Authorized User. A person who, by virtue of training or experience, has been authorized by the RCC to use ionizing radiation for a given purpose.

j. Background Radiation. Radiation from cosmic sources, naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material), and global fallout as it exists in the environment from the testing of nuclear explosive devices. Background radiation does not include radiation from source, byproduct, or special nuclear materials regulated by the Commission.

k. Badge. Film badges are no longer used for dosimetry by the Army. Thermoluminescent dosimeters are the current issue. For purposes of this document and interactions with the HPO, the terms "badge", "TLD" and "dosimeter" are used interchangeably. See "Individual Monitoring Devices."

l. Becquerel. One becquerel = one disintegration per second.

m. Byproduct Material.

(1) Any radioactive material (except special nuclear material) yielded in, or made radioactive by exposure to the radiation incident to, the process of producing or utilizing special nuclear material; and

(2) The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition.

n. Class (or lung class or inhalation class). A classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W, or Y, which applies to a range of clearance half-times. Clearance half-times are:

(1) For Class D (days) material: less than 10 days.

(2) For Class W (weeks) material: 10 to 100 days.

(3) For Class Y (years) material: greater than 100 days.

o. Collective Dose. The sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

p. Committed dose equivalent ($H_{T,50}$). The dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

q. Committed effective dose equivalent ($H_{E,50}$). The sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues ($H_{E,50} = W_T H_{T,50}$).

r. Controlled Area. An area, outside of a restricted area but inside the site boundary, access to which can be limited for any reason.

s. Curie (Ci). One curie = 3.7×10^{10} disintegrations per second = 3.7×10^{10} becquerels = 2.22×10^{12} disintegrations per minute.

t. Declared Pregnant Radiation Worker. A woman who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of conception. The NRC term for this individual is "Declared Pregnant Woman," which is also used in this memorandum.

u. Declared Pregnant Woman. See "Declared Pregnant Radiation Worker."

v. Deep-Dose Equivalent. (H_d) The dose equivalent at tissue depth of 1 centimeter (1000 milligrams per square centimeter) (applies to external whole-body exposure).

w. Derived Air Concentration (DAC). The concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour), results in an intake of one ALI. DAC values are given in Table 1, Column 3, of Appendix B to 10 CFR 20.1001-20.2401.

x. Derived Air Concentration-Hour (DAC-hour). The product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours. 2,000 DAC-hours represents one ALI.

y. Deterministic Effect. See "Nonstochastic Effect."

z. Dose (or Radiation Dose). A generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent, as defined in other paragraphs of this appendix.

aa. Dose Equivalent (H_T). The product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

bb. Dosimetry Processor. An individual or organization that processes and evaluates individual monitoring equipment in order to determine the radiation dose delivered to the equipment.

cc. Effective Dose Equivalent (H_E). The sum of the products of the dose equivalent to the organ or tissue (H_T) and the weighting factors (W_T) applicable to each of the organs or tissues that are irradiated ($H_E = W_T H_T$).

dd. Embryo/Fetus. The developing human organism from conception until the time of birth.

ee. Entrance (or Access Point). Any location through which an individual could gain access to radiation areas or to radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.

ff. Exposure. Being exposed to ionizing radiation or to radioactive material.

gg. External Dose. The portion of the dose equivalent received from radiation sources outside the body.

hh. Extremity. Hand, elbow, arm below the elbow, foot, knee, or leg below the knee.

ii. Eye Dose Equivalent. External exposure of the lens of the eye and taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 milligrams per square centimeter).

jj. Gray (Gy). The SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (100 rads).

kk. High Radiation Area. An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

ll. Human Use. The internal or external administration of radioactive materials or ionizing radiation to human beings.

mm. Individual. Any human being.

nn. Individual Monitoring.

(1) The assessment of dose equivalent by the use of devices designed to be worn by an individual.

(2) The assessment of committed effective dose equivalent by radiobioassay (see "Radiobioassay") or by determination of the time-weighted air concentrations to which an individual has been exposed, i.e., DAC-hours.

(3) The assessment of dose equivalent by the use of survey data.

oo. Individual Monitoring Devices (Individual Monitoring Equipment). Devices designed to be worn by a single individual for the assessment of dose equivalent such as film badges, thermoluminescent dosimeters (TLDs), pocket ionization chambers, and personal ("lapel") air sampling devices.

pp. Internal Dose. That portion of the dose equivalent received from radioactive material taken into the body.

qq. In Vivo Measurements. Measurement of gamma or x-radiation emitted from radioactive material located within the body for the purpose of detecting or estimating the quantity or radioactive material present.

rr. Licensed Material. Source material, special nuclear material, or byproduct material received, possessed, used, transferred or disposed of under a general or specific license issued by the Commission.

ss. Licensee. The holder of the license.

tt. Limits (Dose Limits). The permissible upper bounds of radiation doses.

uu. Member of the Public. An individual in a controlled or unrestricted area. However, an individual is not a member of the public during any period in which the individual receives an occupational dose.

vv. Minor. An individual less than 18 years of age.

ww. Monitoring (Radiation Monitoring, Radiation Protection Monitoring). The measurement of radiation levels, concentrations, surface area concentrations or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

xx. Nonstochastic Effect (Deterministic Effect). Health effects, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation induced cataract formation is an example of a nonstochastic effect.

yy. Occupational Dose. The dose received by an individual in a restricted area or in the course of employment in which the individual's assigned duties involve exposure to radiation and to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include dose received from background radiation, as a patient from medical practices, from voluntary participation in medical research programs, or as a member of the general public.

zz. Person. Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the NRC or DOE [except that DOE shall be considered a person within the meaning of the regulations in 10 CFR Chapter I to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the NRC under section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244), the Uranium Mill Tailings Radiation Control Act of 1978 (92 Stat. 3021), the Nuclear Waste Policy Act of 1982 (96 Stat. 2201), and section 3(b)(2) of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (99 Stat. 1842)], any State or any political subdivision of or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity, and any legal successor, representative, agent, or agency of the foregoing.

aaa. Public Dose. The dose received by a member of the public from exposure to radiation and to radioactive material released by a licensee, or to another source of radiation either within a licensee's controlled area or in unrestricted areas. It does not include occupational dose or doses received from background radiation, as a patient from medical practices, or from voluntary participation in medical research programs.

bbb. Quality Factor (Q). The modifying factor [listed in tables 1004(b).1 and 1004(b).2 of 10 CFR 20.1004] that is used to derive dose equivalent from absorbed dose.

ccc. Quarter. A period of time equal to one-fourth of the year observed by the licensee (approximately 13 consecutive weeks), providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.

ddd. Rad. The special unit of absorbed dose. One rad is equal to an absorbed dose of 100 ergs per gram or 0.01 joule per kilogram (0.01 gray).

eee. Radiation (Ionizing Radiation). Alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this memorandum, does not include non-ionizing radiation, such as radiowaves, microwaves, or visible, infrared, or ultraviolet light.

fff. Radiation Area. An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

ggg. Radiation worker. An individual occupationally exposed to ionizing radiation.

hhh. Radiobioassay. The determination of kinds, quantities, or concentrations, and, in some cases, the locations of radioactive material in the human body, whether by direct measurement (in vivo counting) or by analysis and evaluation of materials excreted or removed from the human body.

iii. Reference Man. A hypothetical aggregation of human physical and physiological characteristics arrived at by international consensus. These characteristics may be used by researchers and public health workers to standardize results of experiments and relate biological insult to a common base.

jjj. Rem. The special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 rem = 0.01 sievert).

kkk. Respiratory Protective Device. An apparatus, such as a respirator, used to reduce the individual's intake of airborne radioactive materials.

lll. Restricted Area. An area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.

mmm. Sanitary Sewerage. A system of public sewers for carrying off waste water and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee.

nnn. Shallow-Dose Equivalent (H_S). Applies to the external exposure of the skin or an extremity, and is taken as the dose equivalent at a tissue depth of 0.007 centimeter (7 milligrams per square centimeter) averaged over an area of 1 square centimeter.

ooo. Sievert. The SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv = 100 rems).

ppp. Site Boundary. That line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

qqq. Source Material.

(1) Uranium or thorium or any combination or uranium and thorium in any physical or chemical form; or

(2) Ores that contain by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material.

rrr. Special Nuclear Material.

(1) Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.), as amended, determines to be special nuclear material, but does not include source material; or

(2) Any material artificially enriched by any of the foregoing but does not include source material.

sss. Stochastic Effects. Health effects that occur randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects.

ttt. Survey. An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.

uuu. Total Effective Dose Equivalent (TEDE). The sum of the deep-dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

vvv. Unrestricted Area. An area, access to which is neither limited nor controlled by the licensee.

www. Very High Radiation Area. An area, accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in 1 hour at 1 meter from a radiation source or from any surface that the radiation penetrates.

xxx. Week. Seven consecutive days starting on Sunday.

yyy. Weighting Factor W_T. The weighting factor, for an organ or tissue (T), is the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of W_T are:

Organ or tissue	Weighting Factor (W_T)
Gonads	0.25
Red bone marrow	0.15
Lung	0.12
Thyroid	0.03
Bone Surfaces	0.03
Remainder	0.30[1]
Whole Body	1.00[2]

[1] 0.30 results from 0.06 for each of 5 "remainder" organs (excluding the skin and the lens of the eye) that receive the highest doses.
[2] For the purpose of weighting the external whole body dose (for adding it to the internal dose), a single weighting factor, $W_T = 1.0$, has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

zzz. Whole Body. For purposes of external exposure, the head, trunk (including male gonads), arms above the elbow, or legs above the knee.

aaaa. Year. The period of time beginning in January used to determine compliance with applicable Federal and DA regulations and the terms of NRC licenses and DARAs, and this memorandum. The licensee may change the starting date of the year used to determine compliance by the licensee provided the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

APPENDIX C

Minimum Acceptable Radiological Laboratories

1. Routine human use of radioactive materials will be accomplished only in facilities identified in a license or license amendment issued by the U.S. Nuclear Regulatory Commission. Before approving a request for non-routine human use (e.g., occasional administration of radionuclides in a ward) or for other than human use of radioactive materials, the Radiation Control Committee shall ensure that the radiological laboratories identified to support a proposed use are adequate.

2. The type of radiological laboratory required will depend upon the amount and radiotoxicity of the radioactive materials, as follows:

Radio-toxicity	ALI		Minimum Quantity (μCi)	Laboratory Required		
	Inhalation	Ingestion		Type I	Type II	Type III
Very High	<1 μCi	<1 μCi	0.1	<10 μCi	≥10 μCi but <10 mCi	≥10 mCi
High	≥1 μCi but <2 mCi	≥1 μCi but <2 mCi	1.0	<100 μCi	≥100μCi but <100 mCi	≥100 mCi
Moderate	≥2 mCi but <80 mCi	≥2 mCi but <60 mCi	10	<1 mCi	≥1 mCi but <1 Ci	≥1 Ci
Low	≥80 mCi	≥60 mCi	100	<10 mCi	≥10 mCi but <10 Ci	≥10 Ci

3. Type I, II, and III laboratories are described below:

Lab Type	Floor	Surfaces	Fume Hood	Room Ventilation	Plumbing	First Aid
I	Easily cleaned	Easily cleaned	No	Normal facilities	Standard	Washing
II	Non-permeable easily cleanable	Easily cleaned	Yes	Good	Standard	Washing & decontamination facilities
III	Continuous sheet welded to walls	Easily cleaned	Yes	Extractor fan	May require special plumbing	Washing & decontamination facilities

APPENDIX D

Ionizing Radiation Dose Limits

1. Occupational Dose Limits for Adults.

a. The occupational dose to individual adults shall not exceed the following limits:

(1) A total effective dose equivalent of 5 rems (0.05 Sv).

(2) The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue, other than the lens of the eye, of 50 rems (0.5 Sv).

(3) An eye dose equivalent of 15 rems (0.15 Sv).

(4) A shallow-dose equivalent of 50 rems (0.50 Sv) to the skin or to any extremity.

b. The assigned deep-dose equivalent and shallow-dose equivalent must be for the part of the body receiving the highest exposure.

c. The RPO shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed at a facility other than BAMC and ISR.

2. Occupational Dose Limits for Minors. The annual occupational dose limits for minors are 10 percent of the annual dose limits specified for adult workers as stated above.

3. Dose to the Embryo/Fetus.

a. The dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, shall not exceed 0.5 rem (5 mSv).

b. The dose to an embryo/fetus shall be taken as the sum of the deep-dose equivalent to the declared pregnant woman and the dose to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

4. Dose Limits for Individual Members of the Public. The total effective dose equivalent to individual members of the public from radioactive materials used at BAMC and ISR shall not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contribution from disposal of radioactive material into sanitary sewerage in accordance with 10 CFR 20.2003. Additionally, the dose in any unrestricted area from external sources will not exceed 0.002 rem (0.02 mSv) in any one hour. If members of the public are permitted access to controlled areas, the limits of this paragraph still apply.

APPENDIX E

ALARA Program

1. Purpose. This appendix describes the BAMC program for maintaining occupational exposures to ionizing radiation ALARA (As Low As Reasonably Achievable). It delegates authority and responsibility to all personnel associated with the radiation protection program to ensure prescribed standards are maintained.

2. General.

a. An annual review of the radiation protection program, including the ALARA Program, will be performed. It shall include reviews of operating procedures and past dose records, inspections, etc., and consultations with the radiation protection staff or outside consultants.

b. Modifications to operating and maintenance procedures and to equipment and facilities will be made where they will reduce exposures unless the cost is considered to be unjustified. Documentation will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented where reasonable. Where modifications have been recommended by qualified experts but not implemented, documentation will be prepared to describe the reasons for not implementing them.

c. In addition to maintaining doses to individuals ALARA, the total of all doses received by all exposed individuals will also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional personnel and significantly increasing the sum of radiation doses received by all involved individuals.

3. Radiation Control Committee.

a. Review of proposed users and uses.

(1) The RCC will thoroughly review the qualifications of each applicant with respect to the types and quantities of materials and uses for which he has applied to ensure that the applicant will be able to take appropriate measures to maintain exposures ALARA.

(2) When considering a new use of byproduct material, the RCC will review the efforts of the applicant to maintain exposures ALARA. The authorized user should have systemized procedures to ensure ALARA and shall have incorporated the use of special equipment such as syringe shields, rubber gloves, etc., in his proposed use.

(3) The RCC will ensure that the authorized user justifies his procedures and that individual and collective doses will be kept ALARA.

b. Delegation of Authority.

(1) Authority is delegated to the RPO for enforcement of the ALARA concept.

(2) The RCC will support the RPO in those instances where it is necessary for the RPO to assert authority. When the RPO is overruled, the RCC will record the basis for its action in the minutes of its quarterly meeting.

c. Review of ALARA programs.

(1) The RCC will encourage all authorized users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.

(2) The RCC will perform a quarterly review of occupational doses with particular attention to instances where investigation levels (ILs) shown in the table in paragraph 7, this appendix, are exceeded. This will normally be done at the quarterly meeting using information provided by the RPO. The principal purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when ILs are exceeded.

(3) The RCC will evaluate overall efforts to maintain doses ALARA on an annual basis. This review will include the efforts of the RPO, HPO, authorized users, and radiation workers, as well as those of the command.

4. Radiation Protection Officer.

a. Annual and quarterly review.

(1) Annual review of the radiation protection program. The RPO will perform an annual review of the radiation protection program for adherence to ALARA concepts. Reviews of specific procedures may be conducted on a more frequent basis.

(2) Quarterly review of occupational doses. The RPO will review, in accordance with the provisions of paragraph 7, this appendix, the doses of authorized users and workers at least quarterly to determine if their doses are ALARA.

(3) Quarterly review of records of radiation surveys. The RPO will review radiation surveys in restricted and unrestricted areas to determine that dose rates and amounts of radioactive contamination were at ALARA levels during the previous quarter.

b. Education responsibilities for the ALARA program.

(1) The RPO will schedule briefings and educational sessions to inform workers of ALARA program efforts.

(2) The RPO will ensure that authorized users, workers, and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy.

c. Cooperative efforts for development of ALARA procedures. Workers will be given opportunities to participate in formulating of the procedures that they will be required to follow.

(1) The RPO will maintain sufficient contact with all authorized users and workers in order to develop ALARA procedures for working with ionizing radiation sources.

(2) The RPO will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and will encourage use of these practices.

d. Reviewing instances of deviation from good ALARA practices. The RPO will investigate all known instances of deviation from good ALARA practices and, if possible, will determine the causes. When the cause is known, The RPO will require changes in the program to maintain exposures ALARA.

5. Authorized Users.

a. New procedures involving potential radiation exposures.

(1) The authorized user will consult with the RPO during planning for use of radioactive materials or ionizing radiation sources for new procedures.

(2) The authorized user will evaluate all procedures before using radioactive materials to ensure that exposures will be kept ALARA. This may be enhanced through applications of trial runs.

b. Responsibility to persons under the authorized user's supervision.

(1) The authorized user will explain the ALARA concept and his commitment to maintain exposures ALARA to all personnel under his supervision.

(2) The authorized user will ensure that personnel under his supervision who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

6. Radiation Workers.

a. The worker will be instructed in the ALARA concept and its relationship to working procedures and work conditions.

b. The worker will know what recourses are available if he feels that ALARA is not being promoted on the job.

7. ALARA Investigational Levels. ALARA ILs are occupational radiation doses to individual workers which, when exceeded, will precipitate a review or investigation by the RPO. The ALARA ILs are listed in the following table.

TABLE. Investigational Levels.

	Investigational Levels (dose equivalent per calendar quarter)	
	Level 1 (IL-1)	Level 2 (IL-2)
1. Total effective dose equivalent	0.125 rem (1.25 mSv)	0.375 rem (3.75 mSv)
2. The sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue, other than the lens of the eye	1.25 rem (12.5 mSv)	3.75 rem (37.5 mSv)
3. Eye dose equivalent	0.375 rem (3.75 mSv)	1.125 rem (11.25 mSv)
4. Shallow-dose equivalent to the skin or to any extremity	1.25 rem (12.5 mSv)	3.75 rem (37.5 mSv)

a. Personnel dose less than IL-1. Except when deemed appropriate by the RPO, no further action will be taken in those cases where an worker's dose in less than the applicable table values.

b. Personnel dose equal to or greater than IL-1 but less than IL-2. The RPO will review the dose of each worker whose quarterly dose equals or exceeds IL-1 and will report the results of the reviews at the first RCC meeting following the quarter when the dose was recorded. No action related specifically to the dose is required unless deemed appropriate by the RCC or the RPO.

c. Personnel dose equal to or greater than IL-2. The RPO will investigate in a timely manner the cause(s) of all personnel exposures equaling or exceeding IL-2 and, if warranted, take action. A report of the investigation and actions taken, if any, will be presented to the RCC at its first meeting following completion of the investigation.

d. Reestablishment of ILs to levels above those listed in the table.

(1) In cases where an individual's or group's doses need to exceed an IL, a new, higher IL may be established on the basis that it is consistent with good ALARA practices for that individual group. Justification for a new IL will be documented.

(2) The RCC will review the justification for, and will approve all revisions of an IL. When a dose equals or exceeds the newly established IL, those actions listed in paragraphs 7b and 7c, this appendix, will be followed.

APPENDIX F

Procedures for Receiving and Safely Opening Packages of Radioactive Material

1. Accepting Delivery of Packages of Radioactive Material.

a. If a package is wet or appears to be damaged, it must be accepted by the addressee and monitored as soon as possible for contamination and radiation levels. In such circumstances:

(1) Ask the carrier to remain at the hospital until it can be determined that neither he nor the delivery vehicle is contaminated.

(2) Contact the Health Physics Office for assistance (see AOD Supplemental Annex R-1).

b. Nuclear Medicine Service. Packages arriving during normal working hours will be delivered by the commercial carrier directly to the Nuclear Medicine Clinic in Building 2376 (Beach Pavilion). When packages arrive after normal working hours, the AOD or NCOD will accompany the carrier to the Nuclear Medicine Clinic and secure the package there.

c. Radiation Therapy Service. Packages arriving during normal working hours will be delivered by the commercial carrier directly to the clinic in Building 1000 (Main Hospital). Packages arriving after normal working hours will be accepted by the AOD in Building 1000. The AOD will secure the package in Room 10A Radiation Therapy Service.

d. Department of Pathology and Area Laboratory Service (DPALS). Packages arriving during normal working hours will be delivered by the commercial carrier directly to the Immunochemistry Section or the Bacteriology Section in Building 2630. Packages arriving between 1630 hours and 2300 hours, Monday through Friday, will be delivered by the commercial carrier directly to the evening technician at Building 2630 (phone 916-7311/7204). The technician will secure packages in the walk-in refrigerator in either Microbiology or Radioimmunoassay. Packages arriving at any other time will be delivered to Building 2376 (Beach Pavilion), Room 64N, where they will be secured until they can be delivered to DPALS.

e. U.S. Army Institute of Surgical Research (ISR). Packages arriving during normal working hours will be delivered by the commercial carrier directly to Building 2653. Packages arriving after normal working hours will be accepted by the ISR NCOD in Building 2653. The NCOD will secure the package in the Physiology Laboratory (Room 3).

f. Other. All other packages arriving after normal working hours will be accepted by the AOD and secured in Room 10A in Building 1000 (Main Hospital) or the Nuclear Medicine Clinic in Building 2376 (Beach Pavilion).

2. Monitoring Packages of Radioactive Material After Receipt.

a. Activities receiving packages must survey each package as soon as practicable after receipt of the package, but not later than 3 hours after the package is received at the activity if it is received during normal

working hours, or not later than 3 hours from the beginning of the next workday if it is received after normal working hours.

b. The external surfaces of packages shall be monitored for radioactive contamination and radiation levels if there is any evidence of degredation of package integrity, such as packages that are crushed, wet, or damaged.

c. The external surfaces of packages displaying a DOT Radioactive White I, Radioactive Yellow II, or Radioactive Yellow III label shall be monitored for radioactive contamination unless the package contains only radioactive materials in the form of a gas (e.g., xenon-133) or in special form as defined in 10 CFR 71.4.

d. The external surfaces of packages displaying a DOT Radioactive White I, Radioactive Yellow II, or Radioactive Yellow III label shall be monitored for radiation levels.

e. Receiving surveys will be documented using BAMC Form 1057 (Figure 3) or by electronic media in accordance with the requirements of 10 CFR 20.2110.

f. The RPO shall be notified immediately when removable radioactive surface contamination exceeds 22 disintegrations per minute per square centimeter (2200 disintegrations per minute per 100 square centimeters), or external radiation levels exceed 200 millirem per hour at any point on the external surface of the package. The RPO, in turn, shall immediately notify the final delivery carrier and, by telephone and telegram, mailgram, or facsimile, the Administrator of the NRC Region IV Office.

3. Safely Opening Packages of Radioactive Material.

a. Only persons authorized by the ARPO will be allowed to open packages containing radioactive material.

b. Put on gloves to prevent hand contamination.

c. Visually inspect the package for any sign of damage (e.g., crushed or wet). If damage is noted, stop at this point and notify the RPO.

d. Measure the radiation level on the external surfaces of the package and record the findings in accordance with paragraph 2e, this appendix. If the radiation level seems abnormally high compared to past measurements, of if the radiation level is greater than 200 mrem/hr, stop the procedure and notify the RPO.

e. Monitor the external surfaces of a labeled package for radioactive contamination unless the package contains only radioactive materials in the form of a gas (i.e. xenon-133) or in special form as defined in 10 CFR 71.4. Wipe at least 300 square centimeters of the external package surface with a disposable cotton swab. Count the swab in the contamination monitor and record the findings in accordance with paragraph 2e, this appendix. If contamination exceeds 2200 disintegrations per minute per 100 square centimeters, stop the procedure and notify the RPO. Be sure to take adequate precautions to prevent the spread of contamination.

f. Open the package as follows:

(1) Open the outer package (following special instructions provided by the manufacturer, if supplied) and remove the packing slip.

(2) Open the inner package and verify that the contents agree with those on the packing slip. Compare requisitions, packing slip and the label on the final container. In the case of special orders (e.g., therapy doses), also compare with the physician's written request.

(3) Check the integrity of the final source container, (i.e., inspect for breakage of seals or vials, loss of liquid, and discoloration of packaging material). If there is reason to suspect contamination, wipe the external surface of the final source container and remove the wipe sample to a low background area for assay. If contamination exceeding 2200 disintegrations per minute per 100 square centimeters is found, stop the procedure and notify the RPO.

(4) Using a radiation survey meter, monitor the packing material and packages for contamination before discarding.

(a) Treat contaminated packing material as radioactive waste.

(b) If packing material is not contaminated, obliterate all radiation labels before discarding in regular trash.

APPENDIX G

Emergency Spill Procedures

1. Estimate the amount of radioactivity spilled and initiate a major or minor spill procedure based on the following amounts. Spills above these amounts are considered major, below are considered minor.

RADIONUCLIDE	MILLICURIES	RADIONUCLIDE	MILLICURIES
P-32	10	I-123	10
Cr-51	100	I-125	1
Co-57	100	I-131	1
Ga-67	100	Tl-201	100
Tc-99m	100	Au-198	10
In-111	10		

2. The decision to implement a major instead of a minor spill procedure depends on many incident-specific variables such as the number of individuals affected, other hazards present, likelihood of spread of contamination, and types of surfaces contaminated as well as the radiotoxicity of the spilled material.

3. Minor Spill of Liquids and Solids.

a. Notify persons in the area that a spill has occurred.

b. Prevent the spread of contamination by covering the spill with absorbent paper.

c. Clean up the spill using disposable gloves and absorbent paper. Carefully fold the absorbent paper with the clean side out and place in a radioactive waste container. Put all gloves and other contaminated disposable material into the radioactive waste container. Contaminated linens should be segregated from disposable wastes and bagged as radioactive contaminated linen to be held for decay.

d. Survey the area with a low-range radiation detection survey meter. Check the area around the spill. Also check your hands, clothing and shoes for contamination.

e. Report the incident to the RPO, 916-7181/7494.

f. The RPO will follow up on the cleanup of the spill by initiating wipe tests for removable contamination. A radioactive spill report will be completed by the RPO and a copy will be forwarded to the activity chief.

4. Major Spill of Liquids and Solids.

a. Clear the area. Notify all persons not involved in the spill to vacate the room.

b. Prevent the spread of contamination by covering the spill with absorbent paper, but do not attempt to clean it up. To prevent the spread of contamination, limit the movement of all personnel who may be contaminated.

c. Shield the source if possible. This should be done only if it can be done without further contamination or a significant increase in radiation exposure to the individual.

d. Close the room and lock or otherwise secure the area to prevent entry.

e. Notify the RPO immediately, 916-7181/7494.

f. Decontaminate personnel by removing contaminated clothing and flushing contaminated skin with lukewarm water and then washing with mild soap. If contamination remains, induce perspiration by covering the area with plastic. Wash the affected area again to remove any contamination that was released by the perspiration.

g. The RPO will supervise the cleanup of the spill and initiate a wipe test for removable contamination. A radioactive spill report will be completed by the RPO and a copy will be forwarded to the activity chief.

5. Recommended Items for Emergency Spill Kits.

6 pairs of disposable gloves; 1 pair of housekeeping gloves
2 disposable lab coats
2 paper hats
2 pairs of shoe covers
1 roll of absorbent paper with plastic backing, or 20 absorbent chux
6 orange plastic trash bags
1 permanent marker
Instructions for "Emergency Spill Procedures"
Spill survey forms
Pencil

APPENDIX H

Procedures for Leak Testing Sealed Sources

1. A list of all sealed sources should be established which includes the isotope, source activity on a specified date, and physical form.

2. A survey meter with speaker should be used to monitor the exposure rate if leak testing sources stronger than a few millicuries.

3. Prepare a separate wipe sample for each source being tested. Use cotton swabs for beta/gamma-emitting sources and filter paper for pure beta emitters (Ni-63). For wiping low energy beta emitters (H-3, C-14, Ni-63), use filter paper that readily dissolves or becomes translucent in liquid scintillation coctail. Number each wipe sample and record the wipe number to the corresponding source listed on the survey form. Wipe samples should be taken as follows:

a. For small sealed sources, such as Cs-137 needles, wipe the entire accessible surface area. Pay particular attention to seams and joints. NOTE: Do not wipe the port of beta applicators.

b. For larger sealed sources and devices, such as bone mineral analyzer or blood irradiator source, take the wipe near the radiation port and on the activating mechanism.

c. For teletherapy machines, take the wipe with the source in the off position. Wipe the area near the shutter mechanism, taking care to touch neither field light and mirror, nor crosshairs. Also wipe the primary and secondary collimators and trimmers.

d. When testing radium sources for radon leakage, submerge the source in a vial of cotton or fine-grained charcoal for a period of 24 hours. The source should be adequately shielded during the leak-testing period. After the 24 hours, remove the source and analyze the absorbent sample as prescribed in paragraph 4, this appendix.

e. When testing gas chromatographs containing a Ni-63 sealed source, wipe the top of the detector cap with a appropriate filter paper wipe wetted with distilled water. If possible, also wipe the detector cell exit ports. The "on/off" mechanism will also be tested for proper operation at least once every 6 months.

4. Samples will be analyzed as follows:

a. Ni-63 wipes will be forwarded in a scintillation vial without cocktail to Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-ML-RR, Aberdeen Proving Ground, MD 21010-5422 for analysis.

b. Wipe samples from pure beta-emitting sources, other than Ni-63, will be assayed using the liquid scintillation counter located at the HPO.

c. Wipe samples from beta/gamma-emitting sources will be assayed in the auto gamma counter located at the HPO.

d. All wipe results will be recorded in counts per minute. The counting efficiency for each source will be determined and the estimated activity in microcuries of the wipe sample will be calculated and recorded.

e. Sources with wipe results yielding 0.005 microcuries or greater will be immediately removed from service and stored in accordance with the requirements of 10 CFR 20 and 10 CFR 30. A report shall be filed with the NRC in accordance with 10 CFR 35.59(e)(2). The report shall be filed within 5 days of the date the leak test result is known with NRC Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Radiation Safety and Safeguards, with a copy to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555. The report shall describe the source/equipment involved, the test results, and action taken.

f. Leak test worksheets containing a listing of all sources tested, calculations, wipe results and initials of person conducting the survey will be maintained on file for a period of 5 years.

APPENDIX I

Trigger Levels for Removable Radioactive Contamination and Radiation Exposure Rates

1. The following trigger levels for removable radioactive contamination have been established by the RPO:

a. At least 100 but less than 220 disintegrations per minute per 100 square centimeters - Area needs decontamination, reswipe not required.

b. 220 disintegrations per minute per 100 square centimeters - Area needs decontamination, reswipe required until contamination levels are less than 100 disintegrations per minute per 100 square centimeters.

2. The following trigger levels for radiation exposure rates have been set as follows:

LOCATION	TRIGGER LEVEL
Nuclear Pharmacy	0.3 mrem/hr (between source cave & dose castle); 0.1 mrem/hr (general pharmacy area)
Nuclear Immaging, Whole-Body Scanning, and Room 5	0.05 mrem/hr (without patient); 0.5 mrem/hr (with patient present; at 1 foot from patient)
Nuclear RIA Lab	0.05 mrem/hr
Nuclear Cardiology	0.05 mrem/hr (without patient); 0.5 mrem/hr (with patient present; at 1 foot from patient)
Radiation Therapy (simulator room)	0.05 mrem/hr
Radiation Therapy (teletherapy room)	0.5 mrem/hr (general area); 10 mrem/hr (1 meter from teletherapy source); 2 mrem/hr (average at 1 meter from teletherapy source)
Radiation Therapy (lab area)	0.05 mrem/hr
Radiation Therapy (radium safe/source cave)	0.5 mrem/hr (6 inches above cave); 0.05 mrem/hr (general area around cave)

LOCATION	TRIGGER LEVEL
Blood Bank (Bldg 1000) (blood irradiator room)	0.2 mrem/hr (1 foot from irradiator; 0.05 mrem/hr (general area in room)
DPALS	0.05 mrem/hr (all areas)
ISR	0.05 mrem/hr (all areas)
Clinical Investigation	0.05 mrem/hr (all areas)
Radioactive Waste Warehouse (Bldg 238)	0.3 mrem/hr (1 foot from Tc-99m & I-131); storage bins, and source cabinet); 0.05 mrem/hr (general area)
Inpatient Therapy room (Ward 12B & 15A)	0.05 mrem/hr (after decontamination or source removal, whichever applies)

APPENDIX J

Radiation Safety Procedures for Radiopharmaceutical Therapy

1. Standards.

a. The HPO will ensure a private room with private bathroom is provided and located away from heavy traffic areas, nursing stations and other patient rooms.

b. Adjacent patient rooms will remain unoccupied and will be blocked during an inpatient radiation therapy.

c. The HPO will place absorbent paper on the floor of the bathroom and heavy traffic areas in the patient room in an effort to contain any radioactive contamination. A plastic liner will be placed over the pillow and bed mattress. Additional plastic bags and absorbent paper will be used to cover items in the room (i.e. chair, light switches, etc.) which may become contaminated by the patient.

d. Only disposable utensils and flatware may be issued to the patient during meals.

e. All items which enter the patient's room will remain in the room until cleared by the HPO or discarded as radioactive waste.

f. Linens will be bagged in the patient's room and will be held as radioactive waste for 10 half-lives before being returned to the ward.

g. Radiation warning signs will be posted on the patient's door and on doors to adjacent rooms so as to be visible to anyone outside the rooms. In addition, a radiation warning label will be posted on the patient's chart. Signs will be removed only by the HPO when the room has been decontaminated and cleared by the HPO.

h. Dosimeters and nursing instructions will be issued to the ward staff for the duration of the patient therapy.

i. Visitors will -

(1) be limited to 1 hour visiting time per person per day.

(2) not be authorized to enter the patient's room.

(3) be required to remain at least 6 feet from the patient and any additional distance necessary to keep doses to themselves below 2 mrem/hr.

(4) not come within 6 feet of the patient under any circumstances.

j. Laboratory samples (i.e. urine, blood) will not be authorized after the patient has been dosed unless approved by the RPO.

k. Patients are not permitted to leave their room at any time during the therapy period unless released by the HPO.

l. Patient will be released to the ward when the dose rate at 1 meter from the patient is less than 5 mrem/hr.

m. The amount of time that any nurses, nurse assistants, or other care providers may spend in the room attending to the patient will be limited to keep their individual doses below 100 millirems during the patient's stay. Based upon the maximum measured dose rate at 1 foot from the patient following administration of the radiopharmaceutical, the HPO shall calculate and post on the door to the patient's room the maximum amount of time allowed per person per day in the patient's room.

2. Decontamination.

a. If the patient vomits or loses bowel control during his stay, the nursing staff must not attempt to clean the area. The RPO must be contacted immediately.

b. After the patient has been released to the ward by the HPO, the room will be blocked until all decontamination procedures have been completed.

c. All linens and absorbent papers will be removed for storage as radioactive waste.

d. The toilet, sink and shower will be flushed thoroughly and scrubbed as needed to ensure adequate decontamination.

e. Wipe samples will be taken throughout the room and bathroom to check for removable contamination.

f. An area survey will be conducted using a dose rate survey meter capable of detecting 0.01 mrem/hr.

g. The room will be released to the ward when all wipe samples yield less than 100 disintegrations per minute per 100 square centimeters of contamination and when the area survey yields no dose rate above 0.05 mrem/hr.

3. The RPO will establish and maintain a Standing Operating Procedure (SOP) for nursing and nuclear medicine personnel involved with radiopharmaceutical therapies (HPO SOP#7 and External SOP#1). In addition, patient instructions will also be provided to ensure applicable standards are maintained.

APPENDIX K

Radiation Safety Procedures for Brachytherapy

1. Standards.

a. The HPO will ensure a private room (with private bathroom if the patient is not restricted to a bed) is provided and located away from heavy traffic areas, nursing stations and other patient room.

b. Adjacent patient rooms will be blocked during an inpatient radiation therapy.

c. Lead shields will be placed around the patient's bed (if patient is restricted to a bed) to help reduce exposure to the nursing staff when attending the patient.

d. If the patient is not restricted to a bed, nursing personnel will be instructed not to enter the patient's room unless there is a medical emergency. All patient interactions must be maintained at a minimum distance of 3 feet (greater distance is preferred).

e. If the patient has a medical condition which will require close contact with the nursing staff, the HPO must be informed prior to the implant.

f. No linens may be removed from the patient's room until cleared by the HPO. This is to ensure that no sources were dislodged during the patient's stay.

g. Radiation warning signs will be posted on doors to the patient's room and any adjacent rooms. In addition, a radiation warning label will be posted on the patient's chart. Signs will be removed only by the HPO when the room has been cleared by the HPO.

h. Dosimeters and nursing instructions will be issued to the ward staff for the duration of the patient therapy.

i. Visitors will -

(1) be limited to 1 hour visiting time per person per day.

(2) be required to remain at least 6 feet from the patient and any additional distance necessary to keep doses to themselves below 2 mrem/hr.

j. Patients are not permitted to leave their room at any time during the therapy period unless approved by the RPO.

k. Patients undergoing brachytherapy shall not be released until all sources have been removed (if implanted with sources having a half-life longer than 125 days), or until the exposure rate at 1 meter is less than 5 millirems per hour (if implanted with sources having a half-life shorter than 125 days).

1. The amount of time that any nurses, nurse assistants, or other care providers may spend in the room attending to the patient will be limited to keep their individual doses below 100 millirems during the patient's stay. Based upon the maximum measured dose rate at 1 foot from the patient after the sources are implanted, the HPO shall calculate and post on the door to the patient's room the maximum amount of time allowed per person per day in the patient's room.

2. Because implants involve the use of sealed radioactive sources, contamination is highly improbable. After all sources have been removed and accounted for by the administrating physician, an area survey will be conducted by the HPO using a low-level dose rate survey meter. The room will be cleared if exposure rates do not exceed 0.1 mrem/hr.

3. The RPO will establish and maintain a standing operating procedure (SOP) for nursing personnel involved with brachytherapy (HPO External SOP#2).

Brooke Army Medical Center	Page of Page(s) Radioactive Materials Permit

In accordance with BAMC Memo 40-72, this permit authorizes the authorized user named below to order, receive and possess the byproduct and/or source material designated below, and to use such material for the purpose(s) and at the place(s) designated below. All the conditions of use are subject to all applicable Federal, Army, and local regulations, the orders of the Brooke Army Medical Center Radiation Control Committee, and all conditions specified below.

1. Authorized User:

3. Permit Number:

2. Location:

4. Expiration Date:

5. Licensed byproduct and/or source material:

6. Chemical/physical form or source ID number:

7. Maximum amount that may be possessed at any one time under this permit

8. Authorized use:

CONDITIONS

SIGNATURE - AUTHORIZED USER

(signature block of RCC chairman)

Date:

Date:

FIGURE 1

BAMC FORM 1056-E, AUG 94

PROPONENT: PVNTMED SVC

RADIOACTIVE MATERIALS MOVEMENT

For use of this form, see BAMC Memo 40-72

1. DATE		
2. FROM	3. TO	4. SHIPPER'S SIGNATURE
		5. RECEIVER'S SIGNATURE

6. DESCRIPTION OF MATERIAL			FOR HEALTH PHYSICS USE ONLY						
a. Container (box, bag, etc.)	b. Isotope Form, Activity	c. Contents (syringes,tubes,etc)	d. Radiation Levels (mrem/hr)			e. Package Number	f. Activity (μCi)	g. Due Out	h. Date Out
			Surface	At 1 Foot	At 3 Feet				

SAMPLE

7. Remarks or Special Precautions

(Except for individual diagnostic doses and BACTEC, radioactive materials movements between BAMC activities must have prior approval of the Health Physics Office).

Completed copies of this form will be provided to (1) Shipper, (2) Receiver, and (3) Health Physics Office (if not shipper or receiver) and will be kept under file number 385-11e.

BAMC FORM 1055, AUG 94

PROPONENT: PREVENTIVE MEDICINE SERVICE

FIGURE 2

RADIOACTIVE SHIPMENT RECEIPT REPORT

For use of this form, see BAMC Memo 40-72

1. PO Number: _____ Survey Date: _____

   Time: _____ Surveyor: _____

2. CONDITION OF PACKAGE:

_____OK _____Punctured _____Status _____Wet _____Crushed _____Other: _____

_____

3. RADIATION UNITS OF LABEL: _____ Units (mrem/hr)

4. MEASURED RADIATION LEVELS:

   a. Package surface _____ mrem/hr

   b. 3 feet from surface _____ mrem/hr

5. DO PACKING SLIP AND VIAL AGREE?

   a. Radionuclide _____ yes _____ no, difference _____

   b. Amount _____ yes _____ no, difference _____

   c. Chemical form _____ yes _____ no, difference _____

6. WIPE RESULTS FROM:

   a. Outer _____ CPM; converted to _____ DPM/100 cm^2

   b. Final source container _____ CPM; converted to _____ DPM/100 cm^2

7. SURVEY RESULTS OF PACKING MATERIAL AND CARTONS _____ mrem/hr, CPM

8. DISPOSITION OF PACKAGE AFTER INSPECTION _____

9. IF HPO/CARRIER NOTIFICATION REQUIRED, GIVE TIME, DATE, AND PERSONS NOTIFIED: _____

_____

SIGNATURE DATE

BAMC FORM 1057, AUG 94 PROPONENT: PVNTMED SVC

FIGURE 3

The proponent for this memorandum is the Preventive Medicine Service, Health Physics Section. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, BAMC, ATTN: HSHE-DHR Fort Sam Houston, Texas 78234-6200.

FOR THE COMMANDER:

OFFICIAL:

HERBERT K. REAMEY III
Colonel, MS
Chief of Staff

DOUGLAS E. MILLS
Lieutenant Colonel, MS
Chief, Information Management Division

DISTRIBUTION:
A plus 25 to HSHE-DHR

TELETHERAPY UNIT OPERATING PROCEDURES

1. Use of the Teletherapy Unit. The unit may only be operated by a qualified technician for treatment purposes only. Operating the unit should be in accordance with manufacturer's instructions. Quality Control tests should be performed in accordance with published SOP (enclosure 1). Precautions should be taken to ensure that only the patient is in the room when the primary beam is on.

2. Safety Device Checks. The safety devices in the Radiation Therapy Service, to include electrical interlocks, warning lights and alarms, back-up timer, and emergency buttons; will be checked on a daily basis by a Radiation Therapy Technician; and on a weekly basis by the teletherapy physicist. Daily checks by the technician will also include a Primalert check, to include a check on emergency power. The dates and results of these checks and a notation of the date on which each malfunction or defect was corrected shall be maintained for at least two years after each check and each correction of a malfunction or defect. If any defect is noted, a DA Form 2407, Maintenance Request, will be submitted to Medical Maintenance as soon as possible.

a. Should the Primalert or its battery pack not be operable, a replacement will be sought from the teletherapy physicist. If one is not available, a survey meter will be used before anyone enters the treatment room. Actions taken will be documented.

b. For malfunctions of other safety devices, a judgement by the teletherapy physicist, Chief, Health Physics (RPO), and Chief, Radiation Therapy will be made and documented to ensure health and safety.

3. Personnel Dosimetry. Teletherapy personnel occupationally exposed to ionizing radiation will wear Army issued dosimeters while on duty in the clinic. The worker will wear the dosimeter somewhere between the shoulders and the waist. The RPO will be notified immediately if someone receives, or suspects that he or she has received an unusual or excessive exposure. Dosimeters will be stored in a location approved by the RPO when they are not being worn.

4. Procedures for Securing the Teletherapy Unit. When the teletherapy unit is not in operation and is otherwise unattended, the following procedures will be followed:

a. The key to the console control will be placed in a secure area.

b. The door to the teletherapy room will be secured.

c. The Radiation Therapy Clinic and the control panel area will be secured after normal duty hours.

5. Instrument Calibration. The teletherapy physicist will ensure that all instruments used for the calibration of the teletherapy unit will be calibrated by the manufacturer or a qualified laboratory at least once every two years. Beam-on monitors and survey instruments shall be checked daily by a technician using the check source assigned to that instrument.

6. Full Calibration of Teletherapy Unit. Both the annual full calibration measurements and the monthly spot-check measurements will be performed in accordance with the provisions of 10 CFR parts 35.21, 35.23 and 35.24.

7. Procedures for Notifying Proper Persons in the Event of an Accident or Unusual Occurrences. In such an event, the Chief, Radiation Therapy, the teletherapy physicist, and the RPO will be notified immediately. Other personnel, such as security and fire-fighting personnel will be notified, as appropriate. During non-duty hours, the Administrative Officer of the Day (AOD) will be notified and will contact the above mentioned personnel at home.

T-780 Teletherapy Unit QC

Approved:

W. A. Wiatrowski 5/17/96

W. A. Wiatrowski, Ph.D., DABR
Physicist

RADIATION THERAPY SERVICE
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234

T-780 (Co^{60}) DAILY QUALITY CONTROL TEST PROCEDURES

I. ODI / MDI AGREEMENT

A. Check to see that the field light and the ODI light are illuminated.

B. Set a 10 x 10 field size. Using the MDI, set the table top height to 0 cm. (i.e., 80 cm source to table top distance as indicated by the MDI).

C. The ODI should now read 80 cm, + / - 2.0 mm.

II. LASER ALLIGNMENT

A. Rotate the gantry to 45 degrees.

B. Check to see that all lasers are illuminated.

C. The sagittal and overhead lasers should point to the light field cross-hairs within + / - 1.0 mm.

D. The lateral lasers should point tangent to the table top and allign within 1.0 mm along cephalad / caudad axis.

III. SAFETY CHECKS

A. Verify that the mechanical source status indicator is visible (use mirror or video monitor) when the source is energized and retracts when the beam is terminated.

B. Verify that "beam on" lights above entry door and on treatment console (red light) are illuminated during "beam on" conditions. Verify that green light on console is illuminated when source is retracted. After the source is retracted, enter the room and activate the emergency shut-off on the hand control. The alarm should sound (requiring reset) and the source should not be able to be activated from the treatment console.

C. Activate the source. Verify operation of the radiation monitor. Slowly open the treatment door until the door interlock trips. DO NOT OPEN THE DOOR MORE THAN 1.0 INCH UNDER ANY CIRCUMSTANCES! Verify that the source has retracted. Verify proper indication given by radiation monitor.

D. Repeat the procedure as indicated in "C" on the previous page except this time unplug the power supply of the radiation monitor from the wall receptule. This will verify proper operation of battery power pack.

E. Verify that the video observation system and the intercom system are operational.

F. Set a 10 x 10 field size. Set the surface of the table to 80 cm SSD using the ODI. Illuminate the light field size and measure the linear dimensions. You should obtain a reading of + / - 2.0 mm.

BROOKE ARMY MEDICAL CENTER

Co^{60} DAILY QC CHECKS

QC CHECKS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
DATE					
ODI VS MDI (+/- 1.0 MM)					
LASER ALLIGNMENT & CROSS HAIR CONGRUENCE (+/- 2.0 MM)					
LIGHT F/S 10 X 10 CM @ 80 SSD (+/- 2.0 mm)					
MECHANICAL SOURCE STATUS INDICATOR					
BEAM ON / OFF LIGHTS					
EMERGENCY SHUT OFF					
CONSOLE					
HAND CONTROL					
DOOR INTERLOCK					
VISUAL RADIATION MONITOR					
WITH BATTERY					
WITHOUT BATTERY					
INTERCOM					
VIDEO MONITOR					
OFF-SHIELD INDICATOR					
TECHNOLOGIST INITIALS					

NOTES:

RADIATION THERAPY SERVICE
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234

T-780 WEEKLY QUALITY CONTROL TEST PROCEDURES

I. ODI / MDI AGREEMENT

A. Check to see that the field size light and the ODI light are illuminated.

B. Set a 10 x 10 cm field size. Using the MDI, set the table top height to 0 cm. (i.e., 80 cm source to table top distance as indicated by the MDI)

C. The ODI should now read 80 cm, + / - 2.0 mm.

II. LASER ALIGNMENT

A. Rotate the gantry to 45 degrees.

B. Check to see that all lasers are illuminated.

C. The sagittal and overhead lasers should point to the light field cross-hairs within + / - 1.0 mm.

D. The lateral lasers should point tangent to the table top and align within 1.0 mm along cephalad / caudad axis.

III. FIELD SIZE AT 80 CM SSD

A. Set the table top height to 80 cm SSD.

B. Set a 5 x 5 cm field size using the collimator readouts.

C. Measure the projected light field. Acceptable tolerance is 2.0 mm in either the width or the length.

D. Repeat for a 10 x 10 and 20 x 20 cm field size.

IV. LIGHT / RADIATION FIELD CONGRUENCE

A. Set the table top to 80 cm SSD.

B. Set a 10 x 10 cm field size.

C. Place a verification film on the table and outline the projected light field on the film by a pressure artifact.

D. Place a 0.5 cm polystyrene bolus on top of the film.

E. Irradiate the film (50 to 100 cGy).

F. The total misalignment should not exceed 2.0 mm in either the width or the length.

OKE ARMY MEDICAL CENTER

Co^{60} WEEKLY QC CHECKS

ATE					
INTERLOCKS					
ODI VS. MDI (+ / - 1.0 MM)					
LASER ALLIGNMENT & CROSS HAIR CONGRUENCE (+ / - 2.0 MM)					
FIELD SIZE @ 80 SSD (+ /- 2.0 MM) F/S = 5 X5 CM					
F/S = 10 X10 CM					
F/S = 20 X 20 CM					
LIGHT / RADIATION FIELD CONGRUENCE					
INITIALS:					

NOTES:

RADIATION THERAPY SERVICE
DEPARTMENT OF RADIOLOGY
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS

SUBJECT: Monthly T-780 Checks

1. The T-780 shall be tested on a monthly basis to include all functional tests and measurements required under the provisions of 10 CFR 35.634.

2. The required tests and measurements shall be performed by, or under the direct supervision and review of, the teletherapy physicist of record (as listed on the USNRC License).

3. The results of those tests shall be recorded on the T-780 "Monthly Quality Control Form".

Wayne A. Wiatrowski, Ph.D., DABR, CHP
Medical Physicist

RADIATION THERAPY SERVICE
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234

SUBJECT: 10 CF 35 REQUIRED MONTHLY CHECKS OF T-780 TELETHERAPY UNIT

I. **TIMER ERROR**

A. Place a farmer chamber with buildup cap at 80 cm TCD. Set a 10 x 10 cm field size.

B. Take three (3) one minute exposures and record the electrometer readings on the monthly QC form.

C. Take four 0.25 minute exposures without resetting the electrometer. Record the electrometer reading. Repeat this sequence three times.

D. Calculate the timer error using the formula provided on the QC form.

E. Compare the measured value to the current value in use. The acceptable tolerance is 0.0005 minute.

II. **OUTPUT**

A. Use the same measurement geometry as previously described.

B. Take three (3) one minute exposures and record the electrometer reading.

C. Calculate the actual exposure rate using the formula provided on the form.

D. The measured value should be within 3.0 percent of the value in use.

III. TIMER CONSTANCY AND ACCURACY

A. Set the timer to 0.5 minute and make an exposure. Repeat the exposure two more times--each time recording the actual "beam on time" as indicated on the veritimer display.

B. Repeat this procedure for 1.0, 2.0, 3.0, and 4.0 minute exposure times.

IV. **Verify the MDI / ODI, light field and radiation field congruence using the same procedures as described in the weekly and daily checks. Record the results.**

V. **Measure beam flatness using verification film under 0.5 cm polystyrene for a 20 x 20 cm field size. Scan the developed film on the MDS scanning densitometer. Record inplane and crossplane flatness.**

IV. PERFORM THE FOLLOWING SAFETY CHECKS

A. Verify that room entry door interlock is functional and that the door closes properly.

B. Move the gantry head "off shield" for the largest possible field size and verify that the beam cannot be energized.

C. Verify proper operation of the beam condition lights.

RADIATION THERAPY SERVICE
DEPARTMENT OF RADIOLOGY
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS

16 May 1994

SUBJECT: Emergency Procedure for Cobalt Teletherapy Unit

If the source for the Cobalt Teletherapy Unit fails to retract following a treatment, immediately implement the following actions:

AMBULATORY PATIENTS:

1. Stand in the doorway and tell the patient to get off the table and leave the room.

2. Turn off the machine.

3. Lock the door, keep the key in your pocket and notify the physics staff.

NON-AMBULATORY PATIENTS:

1. Enter the room and move the hand control behind the concrete barrier.

2. If possible rotate the table out of the primary beam.

3. If possible close the collimators.

4. Turn off the machine.

5. Insure that all individuals required to lift the patient carry a pocket dosimeter or film badge.

6. Enter the room and move the patient from the stretcher.

7. Lock the door, put the key in your pocket and notify the physics staff.

8. Notify:

Physicist - Wayne A. Wiatrowski, Ph.D. - 6-6905, Beeper 617-5260, enter 153, enter phone #

Chief, Radiation Therapy Service
Antonio E. Frias, M.D., COL, MC - 6-6341

Health Physics - 6-7181.

A. Frias Col MC

ANTONIO E. FRIAS, M.D.
COL, MC
C, Radiation Therapy Service

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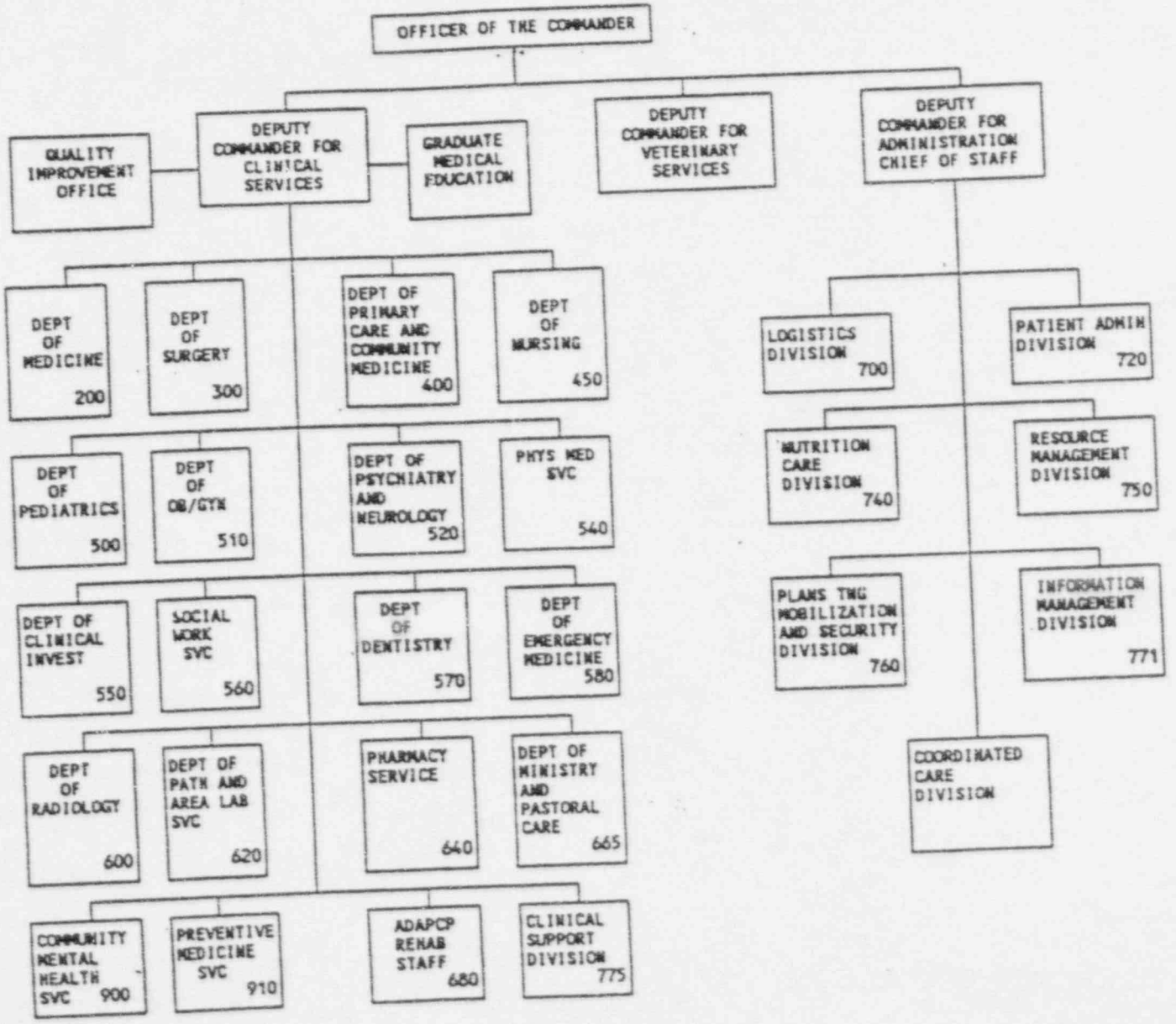

SECTION I .....

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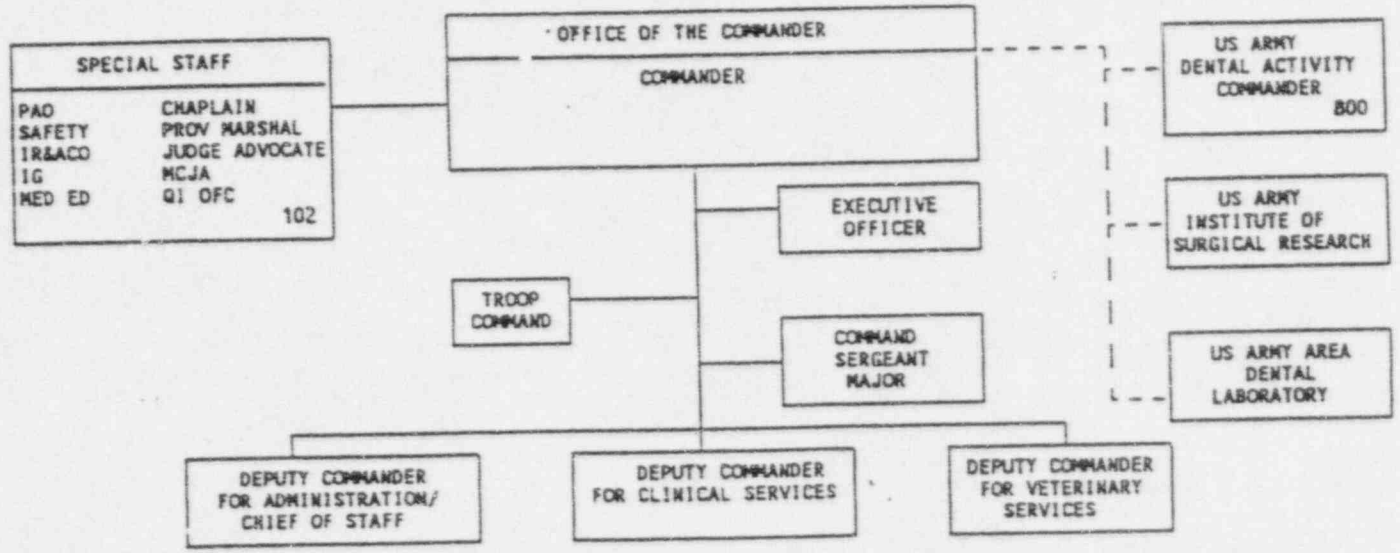
CCNUM WS0293
EDATE 921002

BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234-6200



LEGEND ——— COMMAND
- - - ATTACHED UNITS

SECTION I .....

DEPARTMENT OF THE ARMY
BROOKE ARMY MEDICAL CENTER
Fort Sam Houston, Texas 78234-6200

BAMC Memorandum
No. 15-1

29 July 1994

Boards, Commissions, and Committees
HOSPITAL BOARDS, COMMITTEES, AND COUNCILS

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Chapter 1

GENERAL PROVISIONS

1. PURPOSE. The purpose of this memorandum is to establish structure, function, and composition for all standing boards, committees, councils, or other such bodies established at Brooke Army Medical Center (BAMC) in order to implement the guidelines and requirements of applicable Department of the Army regulations and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

2. APPLICABILITY. The provisions of this memorandum are applicable to all standing boards, committees, councils, and other such bodies established at BAMC.

3. REFERENCES.

a. AR 15-1, Committee Management.

b. BAMC Memo 40-118, Quality Improvement Program.

c. Accreditation Manual for Hospitals (AMH), Joint Commission on Accreditation of Healthcare Organizations.

d. Selected references for each board, committee, or council as reflected in Chapter 2.

4. EXPLANATION OF ABBREVIATIONS AND TERMS.

a. Abbreviations.

(1) AHS - Academy of Health Sciences, U.S. Army

(2) ALS - Advanced Life Support

(3) AMEDDC&S - Army Medical Department Center and School

(4) APC - Ambulatory Patient Care

(5) BAMC - Brooke Army Medical Center

(6) BLS - Basic Life Support

(7) CID - Criminal Investigation Division

(8) CofS - Chief of Staff

(9) CPR - Cardiopulmonary Resuscitation

(10) CSM - Command Sergeant Major

(11) DCA - Deputy Commander for Administration

(12) DCdr - Deputy Commander

(13) DENTAC - Dental Activity

(14) EMS - Emergency Medical Service

(15) EOC - Emergency Operations Center

(16) EOP - Equal Opportunity Program

(17) FSH - Fort Sam Houston

(18) FY - Fiscal Year

(19) HQ - Headquarters

(20) HSC - U.S. Army Health Services Command

(21) IACUC - Institutional Animal Care and Use Committee

(22) IBC - Institutional Bioethics Committee

(23) IRB - Institutional Review Board

(24) ISR - U.S. Army Institute of Surgical Research

(25) JCAHO - Joint Commission on Accreditation of Healthcare Organizations

(26) MTF - Medical Treatment Facility

(27) NCOIC - Noncommissioned Officer in Charge

(28) OIC - Officer in Charge

(29) OPSEC - Operations Security

(30) PAS - Patient Appointment Service

(31) PRO - Patient Representative Office

(32) QI - Quality Improvement

(33) QIC - Quality Improvement Committee

(34) RM - Risk Management

(35) TMC - Troop Medical Clinic

b. Terms.

(1) Ad hoc committee. A committee with a specified life of 1 year or less whose purpose is limited to problems of limited impact and is nonrecurring.

(2) Ad hoc member. An individual who attends a committee for the purpose of dealing with a specific subject matter or agenda item.

(3) Committee. A group of persons with collective responsibility appointed to consider, investigate, advise, and usually to report on specific problems or subject areas.

(4) Ex officio member. A member by virtue of office or position who provides advice and counsel without vote.

(5) Subcommittee. A subelement of a committee consisting of more than one person and having a specific responsibility. Findings are reported back to the committee for full approval or disapproval.

5. BACKGROUND. This memorandum provides a comprehensive guide for the organization and function of all BAMC standing boards, committees, councils, or other such bodies. Standardization of the hospital committee structure facilitates interaction between various committees provides for easier administrative oversight by the Executive Committee and QIC, and promotes better, more efficient patient care.

6. RESPONSIBILITIES.

a. The Chairman will:

(1) Chair the meeting to ensure the board, committee, or council accomplishes the assigned responsibilities.

(2) Prepare or ensure the preparation of an appropriate agenda in advance of scheduled meetings.

(3) Ensure appropriate administrative material and minutes of the meeting are prepared, normally by the recorder.

b. Members will:

(1) Actively participate in discharging the committee responsibilities.

(2) Represent the interests of their department, division or service at the meetings.

(3) Attend each meeting unless excused by the chairman and ensure appropriate representation is provided when excused.

c. Recorder will summarize and record the activity of the meeting, obtain the approval of and signature of the chairman, and distribute the minutes as indicated in paragraph 7f, below.

7. ADMINISTRATIVE DETAILS.

a. Each board, committee, or council will convene at the intervals or frequency indicated in the applicable section of this memorandum. If the meeting is not convened within the prescribed frequency, a notation as to the reason will be included in the minutes of the next meeting.

b. When an agenda is prepared, a copy will be distributed to each member at least 5 working days prior to the scheduled meeting.

c. Membership to committees will be designated by position and title only, except for the membership of the Institutional Review Board whose members are appointed upon recommendation of the Deputy Commander and Commander.

d. A quorum must be present to conduct a meeting. Quorum will consist of a majority of voting members.

e. If a committee member is appointed by name to a committee, no vice representative will be shown in the minutes. The attendee will be shown under "Others Present" in the minutes.

f. Minutes of each meeting will be prepared and signed by the appropriate chairman and recorder in accordance with the sample format (Appendixes A-C). The recorder will submit the minutes as indicated below:

(1) If minutes are to be reviewed by the QIC, the original and two complete copies of the minutes (signed by the chairman and recorder), to include the executive summary, will be submitted to the recorder, QIC, within 5 working days after the meeting.

(2) If minutes are to be reviewed by the Executive Committee, the original and two copies of the minutes, to include the executive summary, will be submitted to the Chief of Staff by the end of the month.

(3) If minutes are to be reviewed by the Commander, the original will be submitted to the Commander within 10 working days after the meeting. Approved minutes are then forwarded to the Chief of Staff for filing.

(4) Committee minutes will be maintained for a 3-year period and then transferred to the installation records holding area for storage.

g. The original copy of the minutes of all meetings, except for the Clinical Risk Management Subcommittee and Credentials Committee will be maintained in the Office of the Chief of Staff. These minutes will be maintained in the Quality Improvement Office. Minutes will be available for review by JCAHO, Inspector General personnel, or other competent authority.

h. Minutes of the following committees are reviewed by the Executive Committee. The approving authority signature block will be prepared for the BAMC Commander as Chairman, Executive Committee:

Civilian Advisory Council
Clinical Investigation Committee
Emergency Planning Committee
Health Consumer Committee
Human Immune Virus (HIV) Management Committee
Institutional Bioethics Committee
Institutional Review Board
Mobilization Planning Committee
Quality Improvement Committee
Radiation Control Committee
Safety and Occupational Health Committee
Utilization Management Committee

i. The following committees are approved by the Commander and the approving authority signature block will be prepared for the BAMC Commander:

Awards Board
Blood Donor Program Board
Civilian Employee Training Committee
Clinical Risk Management Committee
Credentials Committee
Family Advocacy Case Management Team
Hospital Education Committee
Human Relations Council
Information Management Guidance Council
Institutional Animal Care and Use Committee
Linen Management Committee
MEDCEN Health Promotion Council
Medical Library Committee
Military Relevant Training Committee
Noncommissioned Officers Development Program Advisory Committee
Operations Security (OPSEC) Committee
Recovering Health Care Provider Monitoring Subcommittee
Space Utilization and Master Planning Board
Transition Committee

j. The following committees report to the QIC:

Blood Transfusion Practices Committee
Cancer Care Committee
Cardiopulmonary Resuscitation Committee
Discharge Planning Committee
Emergency Medical Services Committee

Head and Neck Cancer Conference
Infection Control Committee
Materiel Standardization Committee
Multidisciplinary Cancer Conference
Multidisciplinary Special Care committee
Pharmacy and Therapeutics Committee
Rabies Advisory Board
Sexual Assault Management Group
Surgical Case Review Committee

k. The following committee reports to the Pharmacy and Therapeutic Committee:

Nutrition Support Committee

14. EXECUTIVE COMMITTEE.

a. Purpose.

(1) To receive and act upon major policy issues which cross department lines and which have significant impact on resources and future direction of the hospital.

(2) To monitor the implementation of the BAMC Strategic Plan.

(3) To receive, act upon, and coordinate recommendations from the designated standing boards, committees, councils, or other bodies concerned with the quality improvement of health care and monitor the implementation of the Commander's decision in reference to these recommendations. The Executive Committee is the senior hospital board and is designated to evaluate and determine functioning efficiency and effectiveness of the various committees at BAMC.

(4) To consider plans for the future growth of and change in the organization and to discuss current problems.

b. Composition.

(1) Commander, Chairman

(2) Deputy Commander, Member

(3) Chief of Staff, Member

(4) Command Sergeant Major, Member

(5) Chief, Department of Nursing, Member

(6) Assistant Chief of Staff, Readiness and Force Integration, Member (nonvoting),

(7) Other staff on an ad hoc basis, Member (nonvoting)

(8) Secretary to the Chief of Staff, recorder without a vote

In the absence of a member and subject to the chairman's approval, a representative or designee with full authority to act on behalf of the member will attend called meetings.

c. Meeting frequency. The sixth working day of each month immediately following morning report.

d. Disposition. Minutes of each meeting will be prepared in accordance with the sample format and signed by the recorder and chairman. The recorder will file the original copy.

e. The Executive Committee will review the minutes of those committees, boards, and councils shown in Chapter 1, paragraph 7h, this memorandum, and will be responsible to ensure that each committee meeting is held in accordance with the requirements of this memorandum, and for acting upon problem areas or recommendations noted with the minutes.

f. References.

(1) AR 40-2, Army Medical Facilities, General Administration

(2) AR 40-400, Patient Administration

(3) AR 40-66, Medical Records and Quality Assurance

40. RADIATION CONTROL COMMITTEE.

a. Purpose. To oversee the use of radioactive material and other radiation sources at BAMC and ISR and to review the radiation protection program.

b. Composition.

(1) Deputy Commander, Chairman

(2) Chief, Department of Clinical Investigation, Member

(3) Chief, Department of Medicine, Member

(4) Chief, Department of Pathology and Area Lab Services, Member

(5) Chief, Department of Radiology, Member

(6) Chief, Nuclear Medicine Service, Member

(7) Chief, Radiation Therapy Service, Member

(8) Chief, Preventive Medicine Service, Member

(9) Representative Hematology/Oncology Service, Member

(10) Director, Cardiac Catheterization Lab, Member

(11) Health Physics Officer, Member and Recorder

(12) Radiation Therapy Physicist, Member

(13) Radiopharmacist, Member

(14) Laser Safety Nurse, Department of Nursing, Member

(15) Representative, Institute of Surgical Research, Member

(16) Safety Manager, Member

(17) Representative, Logistics Division, Member

(18) Representative, Quality Assurance, Member

In the absence of a member, a representative or designee with full authority to act on behalf of a member will attend called meetings.

c. Functions and responsibilities.

(1) Be familiar with all pertinent federal and DA regulations, terms of the Nuclear Regulatory Commission (NRC), byproduct material licenses (BML), and DA radioactive materials authorizations (DARA) issued to BAMC, and information submitted in support of requests for NRC, BML, DARA, and their amendments.

(2) Review the training and experience of all individuals who use radiation to ensure that their qualifications are sufficient to enable them to perform their duties safely and in accordance with pertinent directives (also, see BAMC Memo 40-72).

(3) Establish a program to ensure that all individuals whose duties may require them to work in the vicinity of radiation sources are properly instructed as required by pertinent directives.

(4) Review and approve, as appropriate, all requests for use of radiation at BAMC and ISR (also see BAMC Memo 40-72).

(5) Prescribe special conditions that will be required during a proposed use of radiation, such as requirements for bioassays, physical examinations, and special monitoring procedures.

(6) Review the entire radiation protection program at least annually to ensure that all activities are being conducted safely and in accordance with pertinent directives.

(7) Recommend remedial action to correct any deficiencies identified in the radiation protection program.

(8) Ensure that NRC, BML, or DARA are amended when necessary prior to any changes in facilities, equipment, policies, procedures, and personnel.

(9) Review the Personnel Dosimetry Report.

(10) Analyze incidents involving radiation safety.

(11) Report results of radiation safety inspections.

d. Meeting frequency. At least once each calendar quarter and at the call of the chairman.

e. Disposition. Minutes of each meeting will be prepared and signed by the chairman and recorder in accordance with the sample format. Minutes of this committee will be submitted for review to the Executive Committee by the third Friday of the month in accordance with chapter 1, paragraph 7f of this memorandum. Copies of the minutes will be maintained on file by the health physics officer and forwarded to OTSG(SGPS-PSP-E), 5109 Leesburg Pike, Falls Church, VA 22041-3258 in accordance with TB Med 525.

f. References.

(1) AR 40-5, Preventive Medicine.

(2) AR 40-14, Control and Recording Procedures for Exposure to Ionizing Radiation and Radioactive Materials.

(3) TB Med 525, Control of Hazards to Health from Ionizing Radiation Used by the Army Medical Department.

APPENDIX A
STANDARD FORMAT FOR COMMITTEE MINUTES

DEPARTMENT OF THE ARMY
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234-6200

REPLY TO ATTENTION OF:

HSHE-XXX (15-1a)

5 Mar 92

MEMORANDUM FOR (Address minutes to the applicable review/approval authority IAW paragraphs 7.h.-7.j.)

SUBJECT: Standard Format for BAMC Committee Minutes

1. CALL TO ORDER: The BAMC _____(committee name)_____ was called to order by ____(chairman's name)____ on __(date)__ at __(time)__ hours in the __(location of meeting)__ IAW BAMC Memo 15-1.

2. MEMBERS PRESENT:

MEMBERS ABSENT:

OTHERS PRESENT:

3. OLD BUSINESS: (Separate subparagraph for each item of old business transacted at the meeting that includes as appropriate a summary of the committee's discussions/deliberations, motions made, results of votes, minority views, committee recommendations, and final disposition [i.e., approved, disapproved, tabled, action pending, forwarded, etc.])

4. NEW BUSINESS: (Separate subparagraph for each item of new business transacted at the meeting that includes as appropriate a summary of the committee's discussions/deliberations, motions made, results of votes, minority views, committee recommendations, and final disposition [i.e., approved, disapproved, tabled, action pending, forwarded, etc.])

5. ACTIONS PENDING: (Summary list of old/new business that still require action by the committee and who is responsible for the action. Actions pending shall be addressed in subsequent minutes under OLD BUSINESS if the action has been completed/closed or under ACTIONS PENDING if the action is still incomplete.)

6. ACTIONS FORWARDED: (Summary list of old/new business that has been forwarded to another committee for final action and the name of the applicable committee.)

7. ADJOURNMENT: The meeting was adjourned at __(time)__ hours. The next meeting will be held _____.

(Recorder Signature Block)

(Chairman Signature Block)

APPROVED/DISAPPROVED: __(date)__

(Review/Approval Authority Signature Block)

RADIATION CONTROL COMMITTEE
BROOKE U.S. ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS 78234-6200

Position	Member
Deputy Commander, Chairman	[1]COL William D. Strampel, [2]MC
Chief, Department of Pathology and Area Laboratory Service	COL Renata B. Greenspan, MC
Chief, Department of Medicine	COL Michael A. Berry, MC
Chief, Department of Radiology	COL Anna K. Chacko, MC
Representative/Laser Safety Nurse, Department of Nursing	Mr. William Martin, R.N., [3]DAC
Director, Cardiac Catheterization Laboratory	[4]MAJ William T. Wright, MC
Chief, Nuclear Medicine Service	COL Rashmikant B. Shah, MC
Chief, Preventive Medicine Service	[5]LTC Jerome J. Karwacki, MC
Radiopharmacist	MAJ Ricky J. Olson, [6]MS
Radiation Protection Officer (Recorder)	MAJ Jonathan E. Tucker, MS
Chief, Department of Clinical Investigation	COL James M. Lamiell, MC
Chief, Radiation Therapy Service	COL Antonio E. Frias, MC
Representative, Hematology/Oncology Service	MAJ Rickey C. Myhand, MC
Representative, Logistics Division	[7]CW2 John M. Petersen, [8]USA
Radiation Therapy Physicist	Wayne A. Wiatrowski, Ph.D.
Representative, Institute of Surgical Research	Ms. Wanda L. Brown, DAC
Safety Manager	Mr. James E. Wenzel, DAC

[1]Colonel
[2]Medical Corps
[3]Department of the Army Civilian
[4]Major
[5]Lieutenant Colonel
[6]Medical Service Corps
[7]Warrant Officer
[8]U.S. Army