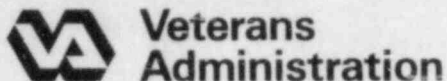


m3

1052



May 27, 1981

Mr. Larry W. Camper
Material Licensing Branch
Division of Fuel Cycle and
Material Safety
United States Nuclear Regulatory
Commission
Washington, D. C. 20555

REF: Control Number 95745

Dear Mr. Camper:

This correspondence is submitted in response to your letter of January 15, 1981, concerning our application for byproduct material license.

The following information is submitted and the numbers refer to the items in your letter.

1a. Please refer to enclosed Supplement A Form AEC-313a (Attachment 1) which is resubmitted. The exact numbers of hours of training received in the fields of training in Item 4 are not now known. Training in these areas was received throughout Dr. Robnett's residency during time spent in radiation therapy and diagnostic radiology as well as nuclear medicine.

1b. Please see resubmitted Supplement A - Preceptor Statement referred to above (Attachment 1). Also see resubmitted Addendum 1 to Supplement A - Item 5 (Attachment 2) and enclosed letter from Chief, Nuclear Medicine Section, Seattle VA Medical Center, dated February 9, 1981 (Attachment 3).

1c. See enclosed additional form NRC 313M - Supplement B from Madigan Army Medical Center (Attachment 4).

1d. See Certificate of Completion regarding a Nuclear Medicine Workshop attended July 1978 (Attachment 5). See the letter from Seattle VA Medical Center referred to in the paragraph 1b above (Attachment 3). During the period between September 1972 and February 1979, Dr. Robnett's practice was primarily limited to diagnostic radiology and included only occasional experience with nuclear medicine studies.

2a. The linearity test will utilize the first vial elution from a new ^{99m}Tc 100 millicuries generator.

In Reply Refer To: 505/114

COPIES SENT TO OFF. OF
INSPECTION AND ENFORCEMENT8507180610 850524
REG5 LIC30
46-19584-01 PDR

2.

U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

2b. Vial shall be counted every day, morning/night at same time for 5 days.

2c. Plotting the measured net activity for each time interval versus the predicted activity on semilog graph paper. This shall be done every 3 months.

3. See Item 7 (Attachment 6) of original application:

Dr. Louis Zibelli is a Diplomate, American Board of Internal Medicine, Subspecialty of Cardiovascular Disease, 1979.

Dr. Carl Gerber is Chief of Staff at VAMC American Lake, Tacoma, WA.

We have no hematologists or pathologists on our staff.

4. The door is to be locked upon leaving as per modified sample memorandum enclosed (Attachment 7).

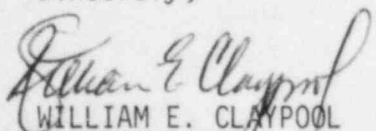
5. We will segregate radioactive waste from non-radioactive waste. We will hold short-lived radionuclide waste for decay to background levels, then dispose of it in ordinary trash after eradicating labels. The waste storage area is outlined on the equipment layout diagram (Attachment 8) which is in a locked room when department personnel are not present. Radiation levels in this area will be surveyed and recorded on a daily basis.

Procedures for waste monitoring will include the following measures. The waste will be monitored in a low background area with GM type survey meter with a beta window using the most sensitive scale. Survey records will be maintained as per 10CFR 20.

6. See enclosed ALARA program (Attachment 9).

7. See enclosed information from Research Service (Attachment 10).

Sincerely,


WILLIAM E. CLAYPOOL
Medical Center Director

cc: Director, Nuclear Medicine Service (115)
VA Central Office
810 Vermont Avenue, N. W.
Washington, D. C. 20420

UNITED STATES ATOMIC ENERGY COMMISSION
APPLICATION FOR BYPRODUCT MATERIAL LICENSE—MEDICAL
SUPPLEMENT A—PRECEPTOR STATEMENT

This page is to be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each. Back of page may be used for comments.

9. NAME AND ADDRESS OF APPLICANT PHYSICIAN (Include ZIP Code)

Major Gary B. Robnett, SSN 489 46 9605
Nuclear Medicine Service
Fitzsimons General Hospital 80240

10. CLINICAL TRAINING AND EXPERIENCE OF PHYSICIAN NAMED IN ITEM 9 ABOVE

(A) ISOTOPE	(B) CONDITIONS DIAGNOSED OR TREATED	(C) No. Cases Observed (See 1 in key below)	(D) No. Cases Involving Personal Participation (See 2 in key below)
I-131	Diagnosis of thyroid function	360	(a) (b) (c)
	Dilution studies		
	Excretion studies Renogram	49	(a) (b) (c)
	Brain tumor localization		
	Scanning studies (Whole Body) (Thyroid Scans) (Uptakes) (13) (71) (180)	12	(a) (b) (c)
	Treatment of hyperthyroidism		
	Treatment of cardiac conditions	4	(a) (b) (c)
	Treatment of thyroid carcinoma		
P-32 Soluble	Treatment of polycythemia		
	Treatment of leukemia		
	Treatment of bone metastases		
	Tumor localization		
	Intracavitary treatment		
XXXXXX Tc-99m	Interstitial treatment		
	Scanning studies (Liver) (Spleen)	(80) (81)	(a) (b) (c)
	Blood determinations (Blood Volume) (Bone Marrow)	(2) (6)	(a) (b) (c)
Cr-51	Scanning studies		
	Diagnosis of pernicious anemia Co-57 Schilling	10	(a) (b) (c)
Co-60	Interstitial treatment		
I-192	Intracavitary treatment		
Co-60 or Cs-137	Teletherapy treatment		
Sr-90	Treatment of superficial diseases of the eye		
Other Isotopes Use back of page	Hg-197 Renal Scan	38	(a) (b) (c)
	MAAG I-131 Lung Scans	68	(a) (b) (c)
	Sr-85 Bone Scan	63	(a) (b) (c)

Key to Column (C) and (D) above

- Observation should consist of observing radioisotope administration techniques and discussion with preceptor the case histories to establish most appropriate diagnostic and/or therapeutic procedure, limitation, contraindications, etc.
- Personal participation should consist of (a) supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation on dosage to be prescribed; (b) collaboration in calibration of the dose and the actual administration of the dose to the patient, including calculation of the radiation dose, related measurements, and plotting of data; and (c) adequate period of training to enable the physician to manage radioactive patients and to follow patients through diagnosis and/or the course of treatment.

11. DATES AND TOTAL NUMBER OF HOURS OF CLINICAL RADIOISOTOPE TRAINING

1 Sep 70 thru 1 Dec 70 (600 hours)

12. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF EUGENE T MORITA, MD, MAJ, MC

Fitzsimons General Hospital
Nuclear Medicine Service

AT Denver, Colorado 80240

(Institution Name and Address)

05-0046-13

(Byproduct Material License Number)

Eugene T. Morita
(Signature of Preceptor)

APPLICATION FOR BYPRODUCT MATERIAL LICENSE—MEDICAL
SUPPLEMENT A—HUMAN USE

PAGE 4

This page may be used for providing additional information.

Brain Scans	212	(a)	(b)	(c)
Xenon-133 Lung Scans	14	(a)	(b)	(c)
Risa I-131 Placentograms	3	(a)	(b)	(c)
Risa I-125 Blood Volume	2	(a)	(b)	(c)
I-125 T4	63	(a)	(b)	(c)
I-125 T3	161	(a)	(b)	(c)
THAT	41	(a)	(b)	(c)
I-131 Rosebengal				
Liver Scans	7	(a)	(b)	(c)
I-131 Urine Excretion	69	(a)	(b)	(c)
PBI-131	3	(a)	(b)	(c)

FITZSIMONS RADIOISOTOPE COMMITTEE-HUMAN USERS CERTIFICATION

Under the provision of paragraph 3d (2), AR 4037, Maj. Gary B. Robnett,
489 46 9605
 is authorized to conduct the following procedures using the following isotopes
 at Fitzsimons General Hospital:

ISOTOPE	DOSE	FORM	PROCEDURES
I-131	10uCi	NaI	Thyroid Uptake
I-131	100uCi	NaI	Thyroid Scan
I-131	15mCi mCi	NaI	Treatment of Hyperthyroid
I-131	100uCi	NaI	Conversion Ratio
I-131	15mCi mCi	NaI	Treatment of Graves Disease
I-131	100-150mCi mCi	NaI	Treatment of Thyroid Malignant
I-131	1mCi mCi	NaI	Chest Scan
I-131	300uCi	Macroaggregated Albumin	Lung Scan
I-131	5uCi	Albumin	Blood Volume
I-131	40uCi	Hippuran	Renogram
I-131	150uCi	Rose Bengal	Liver Scan
I-131	5uCi	Albumin	Placental Localization
I-131	300uCi	Cholegrafen	Heart Scan
I-125	0.5uCi	NaI	T3 Invitro
Tc-99m	10mCi	Pertechnetate	Brain Scan
(fr Mo 99 generator)			
Na-133	15uCi	Colloidal	Liver Scan
Cr-51	50uCi	Sodium Chromate	Blood Volume
Cr-51	150uCi	Sodium Chromate	Red Blood Cell Survival
Cr-51	200uCi	Sodium Chromate	Spleen Scan
Cr-51	50uCi	Sodium Chromate & Chromic Chloride	Determination of gastro-intestinal bleeding
Cr-57	0.5uCi	Vitamin B-12	Schilling Test
Hg-197	150uCi	Chlormerodrin	Kidney Scan
Hg-197	150uCi	Chlormerodrin	Renal Uptake
Sr-85	100uCi	Nitrate	Bone Scan
I-125	0.1 uCi	NaI	T4 Invitro

4 Copies
 1 to Individual
 1 to 201 file
 1 to Mins of Radioisotope Committee
 1 to Files of Radioisotope Committee

John B. Campbell
 JOHN B. CAMPBELL, MD
 LT COL, MC
 Chairman, Radioisotope Committee

ITEM 8, October 24, 1980

DISPOSITION FORM

DA FORM 2496-10

W. J. ...

REFERENCE OR OFFICE SYMBOL

SUBJECT

MEDEO-X

Radioisotope Qualification Forms

TO Ch, Military Personnel Div,
Officer Records Section

FROM Ch, Nuclear Med Service

DATE 5 Apr 71

CMT 1

Dr Morita/hb/22133

In accordance with paragraph 3c, (6), AR 40-57, these radioisotope qualification forms on Maj. Gary B. Robnett, SSN 489 46 9605, will be a permanent part of the individual's 201 file.

Eugene T. Morita

EUGENE T MORITA, MD
Maj, MC
Chief, Nuclear Medicine Service

Approved by Radioisotope Committee 6 April 1971. Request this DF, together with attached radioisotope qualification forms, be made a permanent part of Maj Robnett's 201 file.

John B. Campbell
JOHN B. CAMPBELL, M.D. *JB*
LTC, MC

Chairman, Radioisotope Committee

1 Incl
as



1.a.
DEPARTMENT OF THE ARMY
FITZSIMONS ARMY MEDICAL CENTER
DENVER, COLORADO 80240

HSF-X

To Whom It May Concern:

Gary B. Robnett, M.D. spent three months of his Radiology residency in the Nuclear Medicine Service, Fitzsimons Army Medical Center. The dates were 1 Sep 70 through 1 Dec 70.

The attached AEC Preceptor statement contains the studies and number of Nuclear Medicine procedures performed during that period.

The current NRC license number is 05-0046-13, expiration date 31 Jul 85.

1 Incl
as

NASSER GHAD, M.D.

COL, MC

Chief, Department of Radiology

ADDRESS ALL COMMUNICATIONS TO THE COMMANDER
FITZSIMONS ARMY MEDICAL CENTER

ADDENDUM 1 TO SUPPLEMENT A - ITEM 5

EXPERIENCE WITH RADIATION:

VA Medical Center, American Lake, Tacoma, WA

February 2, 1979 to December 31, 1979

Brain Scan	66
Liver/Spleen Scan	46
Bone Scan	52
Lung Scan	26
Venogram	8
Renal Scan	2
Resting Thallium	1
Exercise Thallium with Redistribution	8
Liver/Lung Scan	1

Veterans
Administration

February 9, 1981



Gary Robnett, M. D.
Chief, Radiology Service (114)
VA Medical Center
American Lake
Tacoma, WA 98493

Dear Dr. Robnett:

This letter will serve to confirm our recent conversation regarding your recent experience in nuclear medicine. Under the direction of the Seattle VA Medical Center NRC Broad License (No. 46-00990-01), you are authorized, and supervised the Nuclear Medicine Laboratory at the American Lake VA Medical Center from February 1, 1979 to February 15, 1980.

In addition, during the month of October of 1978, you spent approximately ten working days observing technical procedures in our laboratory, discussing radiation principles with David Williams, Ph.D., Nuclear Physicist and Radiation Protection Officer, and participated in study reading sessions with myself and the nuclear medicine resident.

If I can be of any further help in documenting your recent experience in nuclear medicine, do not hesitate to call.

Sincerely,

GLEN W. HAMILTON, M. D.
Chief, Nuclear Medicine Section,
Chairman, Radiation Safety Committee, VAMC;
Professor of Medicine,
University of Washington

PRECEPTOR STATEMENT

Supplement B must be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, obtain a separate statement from each.

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS		KEY TO COLUMN C PERSONAL PARTICIPATION SHOULD CONSIST OF: 1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage. 2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data. 3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.
FULL NAME		
GARY BOYD ROBNETT		
STREET ADDRESS		
VA Medical Center		
American Lake		
CITY	STATE	ZIP CODE
Tacoma	WA	98493

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION		
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES		
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING		
P-32	EYE TUMOR LOCALIZATION		
Ge-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING		
	CARDIAC IMAGING		
	THYROID IMAGING		
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING		
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING		
	LUNG IMAGING		
	BONE IMAGING		
OTHER			

PRECEPTOR STATEMENT (Continued)

2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN (Continued)

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		
P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM AND CARDIAC CONDITION		
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
	TELE THERAPY TREATMENT		
Co-60 or Cs-137	TELE THERAPY TREATMENT		
	TELE THERAPY TREATMENT		
Sn-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	5	
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS	6	
Other			

3. DATES AND TOTAL NUMBER OF HOURS RECEIVED IN CLINICAL RADIOISOTOPE TRAINING

May 1981 - 5 hours.

4. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF:

a. NAME OF SUPERVISOR
Stanton R. Brown, M.D.
Chief, Nuclear Medicine Service

b. NAME OF INSTITUTION
Madigan Army Medical Center

c. MAILING ADDRESS
Tacoma, WA 98431

d. CITY
same as above

5. MATERIALS LICENSE NUMBER(S)

Lic. # 46-02645-03

6. PRECEPTOR'S SIGNATURE

Stanton R. Brown

7. PRECEPTOR'S NAME (Please type or print)

STANTON R. BROWN, MD, COL, MC
Chief, Nuclear Medicine Service

8. DATE

22 May 81

Certificate of Completion

This is to certify

GARY B. ROBNETT, M.D.

has completed a
Continuing Medical Education Offering
entitled
NUCLEAR MEDICINE WORKSHOP

This continuing medical education offering meets the criteria for 15 hours of
Category I Physician's Recognition Award Credit
issued by the
American Medical Association

**The
InterWest**

sponsored by

**Regional Medical
Education Center**

Veterans
Administration

W. W. Wolcott M.D.
Medical Director

Joseph B. B. M.D.
Co-Director

26-28 July 1978

MEDICAL ISOTOPES COMMITTEE

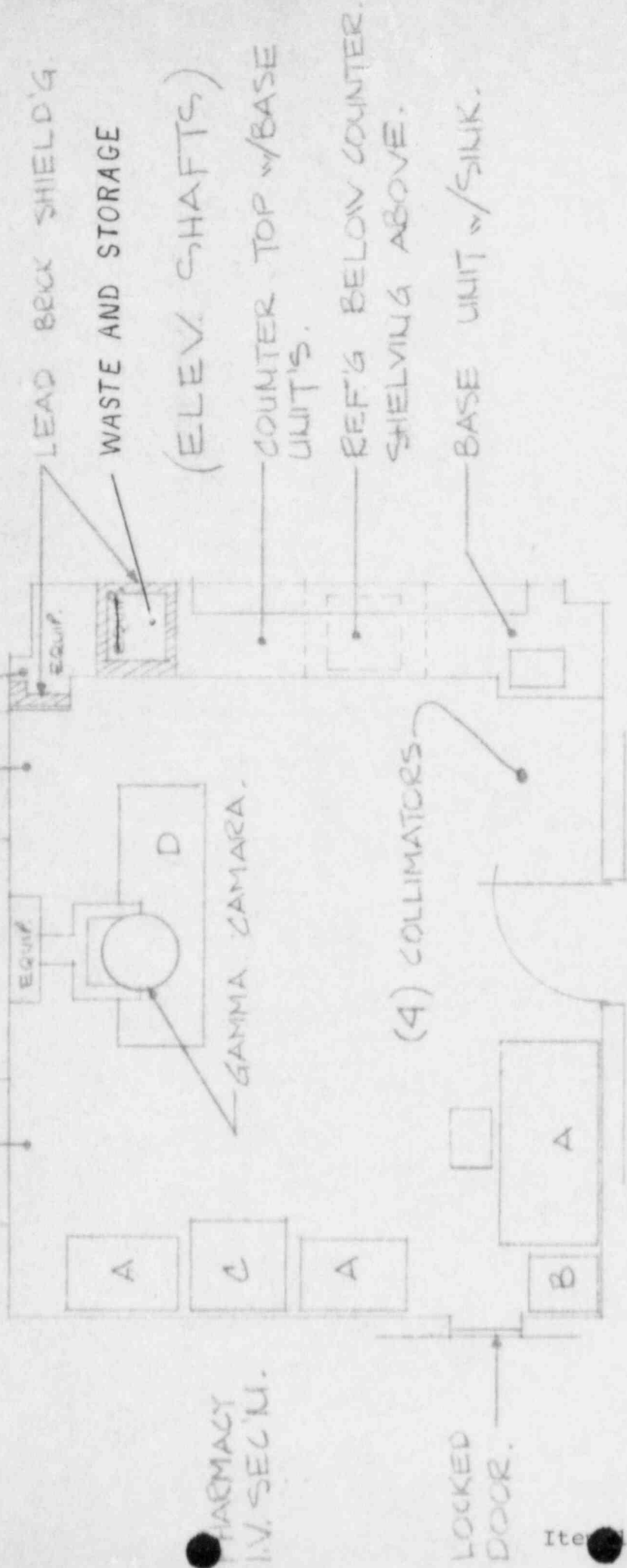
Gary B. Robnett, M.D.	Radiology
Louis Zibelli, M.D.	Cardiology
Carl Gerber, M.D., Ph.D.	Neurology, Psychiatry Chief of Staff

Dr. Louis Zibelli is a Diplomate, American Board of Internal Medicine, Subspeciality of Cardiovascular Disease, 1979.

Dr. Carl Gerber is Chief of Staff, VA Medical Center, American Lake, Tacoma, WA.

(We have no hematologists or pathologists on our staff)

HVAC UNIT BELOW WINDOW



PHARMACY
I.V. SEC'N.

201 NUCLEAR MEDICINE RM. 126 EQUIPMENT LAYOUT

G.M. STEBBINS 22 AUG 80 (2ND REVISION)
1/4" = 1'-0" VAMC AMERICAN LAKE, VA.

- A: TABLE
- B: FILE CABINET
- C: CONSOLE
- D: GURNEY TABLE

RM. DIMENSIONS 16'-6" X 20'-0"

Model Program for Maintaining Occupation
Radiation Exposures at Medical Institutions ALARA

VA Medical Center, American Lake
(Licensee's Name)

May 27, 1981
(Date)

I. Management Commitment

- a. We, the management of this (medical facility, hospital, etc.) are committed to the program described in this paper for keeping exposures (individual and collective) as low as reasonably achievable (ALARA). In accord with this commitment, we hereby describe an administrative organization for radiation safety and will develop the necessary written policy, procedures and instructions to foster the ALARA concept within our institution. The organization will include a Radiation Safety Committee (RSC)¹ and a Radiation Safety Officer (RSO).
- b. We will perform a formal annual review of the radiation safety program including ALARA considerations. This shall include reviews of operating procedures and past exposure records, inspections, etc., and consultations with the radiation protection staff or outside consultants.
- c. Modification to operating and maintenance procedures and to equipment and facilities will be made where they will reduce exposures unless the cost, in our judgement, is considered to be unjustified. We 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 but not implemented, we will be prepared to describe the reasons for not implementing them.
- d. In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the 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 people and significantly increasing the sum of radiation doses received by all involved individuals.

¹ Private practice physician licenses do not include a RSC.

II. Radiation Safety Committee (RSC)²

a. Review of Proposed Users and Uses

1. The RSC 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 assure that the applicant will be able to take appropriate measures to maintain exposure ALARA.
2. When considering a new use of byproduct material, the RSC will review the efforts of the applicant to maintain exposure ALARA. The user should have systematized 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 RSC will ensure that the user justifies his procedures and that dose will be ALARA (individual and collective)

b. Delegation of Authority

(The judicious delegation of RSC authority is essential to the enforcement of an ALARA program.)

1. The RSC will delegate authority to the RSO for enforcement of the ALARA concept.
2. The RSC will support the RSO in those instances where it is necessary for the RSO to assert his authority. Where the RSO has been overruled, the Committee will record the basis for its action in the minutes of the Committee's quarterly meeting.

c. Review of ALARA Program

1. The RSC will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.
2. The RSC will perform a quarterly review of occupational radiation exposure with particular attention to instances where Investigational Levels in Table I below are exceeded. The principle 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 Investigational Levels are exceeded (see paragraph VI).³

²The RSO on private practice physician licenses will assume the responsibilities of the RSC under Section II

³The NRC has emphasized that the Investigational Levels in this program are not new dose limits but, as noted in ICRP Report 26, "Recommendations of the International Commission on Radiological Protection", serve as check points above which the results are considered sufficiently important to justify further investigations.

3. The RSC will evaluate our institution's overall efforts for maintaining exposures ALARA on an annual basis. This review will include the efforts of the RSO, authorized users, and workers as well as those of management.

III. Radiation Safety Officer (RSO)

a. Annual and Quarterly Review

1. Annual review of the Radiation Safety Program. The RSO will perform an annual review of the Radiation Safety Program for adherence to ALARA concepts. Reviews of specific procedures may be conducted on a more frequent basis.
2. Quarterly review of Occupational Exposures. The RSO will review at least quarterly the external radiation exposures of authorized users and workers to determine that their exposures are ALARA in accordance with the provisions of paragraph VI of this program.
3. Quarterly review of records of Radiation Level Surveys. The RSO will review radiation levels in unrestricted and restricted areas to determine that they were at ALARA levels during the previous quarter.

b. Education Responsibilities for an ALARA Program

1. The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.
2. The RSO will assure that authorized users, workers and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the RSC and the RSO are committed to implementing the ALARA concept.

c. Cooperative Efforts for Development of ALARA Procedures

Radiation workers will be given opportunities to participate in formulation of the procedures that they will be required to follow.

1. The RSO will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
2. The RSO will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and encourage the use of those procedures.

d. Reviewing Instances of Deviation from Good ALARA Practices

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

IV. Authorized Users

a. New Procedures Involving Potential Radiation Exposures

1. The authorized user will consult with, and receive the approval of, the RSO and/or RSC during the planning stage before using radioactive materials for a new procedure.
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 the application of trial runs.

b. Responsibility of the Authorized User to Those He Supervises

1. The authorized user will explain the ALARA concept and his commitment to maintain exposures ALARA to all of those he supervises.
2. The authorized user will ensure that those under his supervision who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

V. Persons Who Receive Occupational Radiation Exposure

- a. The worker will be instructed in the ALARA concept and its relationship to his 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.

VI. Establishment of Investigational Levels in Order to Monitor Individual Occupational External Radiation Exposures

This institution (or private practice) hereby establishes Investigational Levels for occupational external radiation exposure which, when exceeded, will initiate review or investigation by the Radiation Safety Committee and/or the Radiation Safety Officer. The Investigational Levels that we have adopted are listed in Table 1 below. These levels apply to the exposure of individual workers.

Table 1

Investigational Levels - (mrems per calendar quarter)		
	<u>LEVEL I</u>	<u>LEVEL II</u>
1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads	125	375
2. Hands and forearms; feet and ankles	1875	5625
3. Skin of whole body*	750	2250

* Not normally applicable to nuclear medicine operations except those using significant quantities of beta emitting isotopes.

The Radiation Safety Officer will review and record on Form NRC-5, Current Occupational External Radiation Exposures, or an equivalent form (e.g. dosimeter processor's report), results of personnel monitoring, not less than once in any calendar quarter, as is required by 10 CFR 20, §20.401. The following actions will be taken at the Investigational Levels as stated in Table 1:

- a. Quarterly exposure of individuals to less than Investigational Level I.

Except when deemed appropriate by the RSO, no further action will be taken in those cases where an individual's exposure is less than Table I values for the Investigational Level I.

- b. Personnel exposures equal to or greater than Investigational Level I, but less than Investigational Level II.

The RSO will review the exposure of each individual whose quarterly exposures equal or exceed Investigational Level I. He will report the results of his reviews at the first RSC meeting following the quarter when the exposure was recorded. If the exposure does not equal or exceed Investigational Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee. The Committee will, however, consider each such exposure in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the Committee minutes.

- c. Exposure equal to or greater than Investigational Level II.

The RSO will investigate in a timely manner the cause(s) of all personnel exposures equaling or exceeding Investigational Level II and, if warranted, take action. A report of the investigation, actions taken, if any, and a copy of the individual's Form NRC-5 or its equivalent will be presented to the RSC at the first RSC meeting following completion of the investigation. The details of these reports will be recorded in the Committee minutes. Committee minutes will be sent to the management of this institution for review. The minutes, containing details of the investigation, will be made available to NRC inspectors for review at the time of the next inspection.

- d. Re-establishment of an individual occupational worker's Investigational Level II Above That Listed In Table I.

In cases where a worker's or a group of worker's exposures need to exceed Investigational Level II, a new, higher Investigational Level II may be established on the basis that it is consistent with good ALARA practices for that individual or group. Justification for a new Investigational Level II will be documented.

The Radiation Safety Committee will review the justification for, and will approve, all revisions of Investigational Levels II. In such cases, when the exposure equals or exceeds the newly established Investigational Level II, those actions listed in paragraph c above will be followed.

VII. Signature of Certifying Official⁴

I hereby certify that this institution (or private practice), has implemented the ALARA Program set forth above.

Signature

Name (print or type)

Title

Institution (or Private Practice) Name and Address:

⁴ The individual who is authorized to make commitments for the administration of the institution (e.g., hospital administrator, etc.) or, in the case of a private practice, the licensed physician.

INSTRUCTIONS FOR ANIMAL CARETAKERS

PROCEDURES FOR USE OF RADIOISOTOPES IN ANIMAL STUDIES

1. Animals: Only mice have been used to date. Rabbits, rats and/or chickens might be used as necessitated by the studies.
2. Isotopes used: Only ^{45}Ca has been used to date. ^3H -thymidine, ^3H -proline, ^3H -leucine, $^{32}\text{P}_1$, or ^{35}S might be used in future studies.
3. Dosage: To date, only injections (IP) of 15 uCi of ^{45}Ca per mouse have been administered. Proportional doses would be used for larger animals. No more than 500 uCi would be given to any animal.
4. Handling of animals in vivo: Radioactive animals are kept in cages, isolated from other animals, with absorbent paper underfoot. Paper is changed as frequently as necessary to avoid animal waste soaking through and disposed of as radioactive waste. If long-term exposures are necessary, so that hair or fur may be contaminated, cages are covered to prevent contamination of the room.
5. Handling of animals post mortum: Animals are anesthetized (over absorbent paper) and surgery is performed over absorbent paper. Contaminated paper is disposed of as radioactive waste. Instruments are normally washed with alcohol and water, but if significant contamination is possible they are swabbed with cotton and alcohol/water and the swabs are disposed of as radioactive waste. If residual radioactivity in the animals is small (e.g; 10 uCi in a mouse) the animals are frozen for subsequent incineration. If contamination is more significant the animals are stored frozen, in clearly labeled freezers, until the radiation level becomes sufficiently low by decay. We do not anticipate exposing animals to amounts of radiation that would require months or years of storage. In such a case, however, animals would be embedded in plastic for disposal as radioactive waste.
6. Cleanup: Under ordinary conditions the animal cages do not become contaminated. Swab samples taken from the cages for liquid scintillation counting, and if radioactivity is insignificant the cages are washed (by machine) as is normal. If contamination is evident the cages are wiped clean with alcohol/water or isoclean as needed, until contamination is insignificant. Wipes are disposed of as radioactive waste.
7. All normal precautions are taken by the animal caretaker (e.g; use of gloves when handling animals, monitoring of the areas with a hand-held monitor as well as swab samples for liquid scintillation counting) and personnel not directly involved in the procedures are not admitted into potentially contaminated areas.

PROCEDURES IN ANIMALS

The only procedures currently used in animals and involving isotopes are the intraperitoneal injection of ^{45}Ca into mice, the subsequent removal of bones (calvaria) from the mice and the incubation of these bones in tissue culture.

ANIMAL HOUSING FACILITIES

	<u>BLDG.</u>	<u>ROOM & DESCRIPTION</u>	<u>SQUARE FEET</u>
(A)	18	117 - Large Rodent Room	3 rooms combined
		118 - Dark Room	336 sq. ft.
		119 - Small Rodent Room	

Room 117 is used for the housing of large rodents; Room 119 is used for the housing of small rodents. Room 118 is used for the housing of animals being kept in a darkened environment.

(B)	18	120 - Procedural Laboratory	73 sq. ft.
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Room 120 is used for minor surgery and basic procedures.

(C)	18	116 - Diet Kitchen	42 sq. ft.
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Room 116 is used for the preparation of food mixtures necessary for each animals diet.

(D)	18	115B- Storage: Dry Feed & Bedding	16 sq. ft.
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Room 115B is used for the storage of dry feed and bedding.

(E)	18	115C- Cage Washing Area	71 sq. ft.
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Room 115C is used for the location of the cage washing machine for cage washing purposes.

(F)	72	1 - Animal Ward (Bird House)	413 sq. ft.
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Room 1 is used for the housing of chickens and quail and also for the storage of their feed.

Total square feet for Bldg. 18	-	538 sq. ft.	(A thru E)
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Total square feet for Bldg. 72	-	413 sq. ft.	(F)
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951 TOTAL SQ. FT. (A thru F)

FORM NRC-313M-SUPPLEMENT A (8-78)		U.S. NUCLEAR REGULATORY COMMISSION		
TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER				
1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER JOHN R. FARLEY, Ph.D.		2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE N/A		
3. CERTIFICATION				
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C		
N/A				
4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES				
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING		
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D	
a. RADIATION PHYSICS AND INSTRUMENTATION	1970 - 1973 U.C. Davis, Calif.	30/80	100	
b. RADIATION PROTECTION	1970 - 1973 U.C. Davis, Calif.	30/80	100	
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	1970 - 1973 U.C. Davis, Calif.	30/80	100	
d. RADIATION BIOLOGY	1970 - 1973 U.C. Davis, Calif.	30/80	100	
e. RADIOPHARMACEUTICAL CHEMISTRY				
5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
^{14}C	10 mCi	U.C. Davis & ALVAMC	1970-77 & 1977-date	Research
^3H	5 mCi	American Lake VAMC	1977-date	Research
^{45}Ca	3 mCi	U.C. Davis & ALVAMC	1975-77 & 1977-date	Research
^{32}P	10 mCi	U.C. Davis & ALVAMC	1970-77 & 1977-date	Research
^{35}S	10 mCi	U.C. Davis	1972-1977	Research

TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER (Con't)

JOHN R. FARLEY, Ph.D.

5. Experience with Radiation

^{125}I	1 mCi	ALVAMC	*1979-date	Research
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* Intermittent use, not continuous

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER GUY A. HOWARD, Ph.D.	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE N/A
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3. CERTIFICATION		
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
N/A		

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES			
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	Central Washington University	20	20
b. RADIATION PROTECTION	University of Oregon	10	20
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	University of Oregon	2	--
d. RADIATION BIOLOGY	University of Oregon	20	5
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience).				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
^3H	1 mCi	Central Wash. U.	1 year	Biological Tracer
^{35}S	2 mCi	Central Wash. U.	1 year	Biolog. Tracer
^3H	5 mCi	Univ. of Oregon	3 years	Biolog. Tracer
^{32}P	5 mCi	Univ. of Oregon	3 years	Biolog. Tracer
^{35}S	1 mCi	Univ. of Oregon	3 years	Biolog. Tracer

TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER (Con't)

GUY A. HOWARD, Ph.D.

5. Experience with Radiation

^{60}Co	0.5 mCi	Univ. of Oregon	1 year	Biological Tracer & Synthesis
^{59}Fe	0.5 mCi	Univ. of Oregon	1 year	Biological Tracer & Synthesis
^{125}I	1 mCi	Friedrich Miescher Institute	2 years	Synthesis & Tracer
^{35}S	1 mCi	Friedrich Miescher Institute	2 years	Synthesis & Tracer

(Many of the same isotopes at the VA Medical Center)

TRAINING AND EXPERIENCE
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER CHUNG-CHING LIU, Ph.D.	2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE N/A
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3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
N/A		

4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
N/A			
a. RADIATION PHYSICS AND INSTRUMENTATION			
b. RADIATION PROTECTION			
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY			
d. RADIATION BIOLOGY			
e. RADIOPHARMACEUTICAL CHEMISTRY			

5. EXPERIENCE WITH RADIATION, (Actual use of Radioisotopes or Equivalent Experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
⁴⁵ Ca	3 mCi/year	American Lake VAMC	2 years	Bone Cultures
³ H-Pro-line	3 mCi/year	American Lake VAMC	2 years	Bone Cultures

Addendum Changes to the Radioisotope License Application:

III. a.

Waste disposal: All solid waste is disposed at the Washington State disposal site at Hanford, WA.

III. Protective Measures Section:

F. A routine survey for contamination is conducted monthly by counting wipe samples (liquid scintillation or Gamma counter) or areas where isotopes are used or stored. The laboratory is also directly monitored with a survey meter monthly (both for Beta and Gamma emission). The meters are available for use at all times. A record of the monthly survey is kept.