Form AEC-313 (5-58)

ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

Form approved. Budget Bureau No. 38-R027.3.

INSTRUCTIONS.–Complete Items 1 through 16 if this is an initial application. If application is for renewal of a license, complete only Items 1 through 7 and indicate new information or changes in the program as requested in Items 8 through 15. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail three copies to: U. S. Atomic Energy Commission, Washington 25, D. C. Attention: Isotopes Branch, Division of Licensing and Regulation. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30 and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20.

1 (a) NAME AND STREET ADDRESS OF APPLICANT. *(Institution, firm, hospital, person, etc.)*

Department of the Army
Fitzsimons General Hospital and USAMRNL
Denver, Colorado 80240

(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. *(If different from 1 (a).)*

Installation named in 1 (a); other installations at which research studies may be conducted under the supervision of Fitzsimons General Hospital with the prior approval of the AEC and SGO

2 DEPARTMENT TO USE BYPRODUCT MATERIAL

Radiology Service
USAMRNL

3 PREVIOUS LICENSE NUMBER(S). *(If this is an application for renewal of a license, please indicate and give number.)*

Renew and combine 5-46-9, 5-46-10, 5-46-11, 5-46-12

4 INDIVIDUAL USER(S). *(Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)*

Users approved by the Radioisotope Committee. AEC-313a Page 3 and Curriculum Vitae submitted

5 RADIATION PROTECTION OFFICER. *(Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)*

Appointed by the Radioisotope Committee. Training and experience submitted

6 (a) BYPRODUCT MATERIAL. *(Elements and mass number of each.)*

Any byproduct material with Atomic nos. 1 to 83 inclusive for animal and in vitro use Byproduct material for human use as itemized in enclosure. (Encl 1)

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. *(If sealed source(s), also state name of manufacturer, model number, number of sources and maximum activity per source.)*

Maximum total amount on hand 10 curies.
Tritium 5 curies
Xenon 2 curies
Any other byproduct material 500 millicuries
Refer to enclosure.

7 DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. *(If byproduct material is for "human use," supplement A (Form AEC-313a) must be completed in lieu of this item. If byproduct material is in the form of a sealed source, include the make and model number of the storage container and/or device in which the source will be stored and/or used.)*

Animal and in vitro research
Human use - A.E.C. 313a

(Continued on reverse side)

56689

Form AEC-313 (5-58)

TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8 TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a Principles and practices of radiation protection	Individuals will have appropriate training and experience prior to approval by Radioisotope Committee, Fitzsimons General Hosp. A.E.C. 313a page 3 and Curriculum vitae included. (Incl 2)		Yes No	Yes No
b Radioactivity measurement standardization and monitoring techniques and instruments			Yes No	Yes No
c Mathematics and calculations basic to the use and measurement of radioactivity			Yes No	Yes No
d Biological effects of radiation			Yes No	Yes No

9 EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
As above				

10 RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary.)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm²)	USE (Monitoring, surveying, measuring)
Refer to appended information. (Incl 3)					

11 METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE. Instruments calibrated at 6 month intervals (or after repairs) by Sacramento Army Depot Field Radiac. Calibration Svc. or Physicist at V.A.Hospital, Denver. Last calibrated November 1963.

12 FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED (For film badges, specify method of calibrating and processing, or name of supplier.) All personnel wear film badge and pocket dosimeter. Film badges processed at 4 week intervals by Lexington Signal Corps. Pocket dosimeters read and charged at 1 week intervals at Fitzsimons General Hospital.

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13 FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached (Circle answer) (Yes) No

14 RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source. Refer to appended information (Incl 4)

15 WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved. Refer to appended information (Incl 4)

CERTIFICATE (This item must be completed by applicant)

16 THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

RECEIVED JAN 16 1964 Division of Licensing & Regulation

Department of the Army, Fitzsimons General Hospital and USAMRNL
Applicant named in item 1

Date 6 December 1963

By: James A Wier
JAMES A WIER, Colonel, MC
Acting Commander
Title of certifying official

WARNING.—18 U. S. C., Section 1001, Act of June 25, 1948, 62 Stat. 749, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 568572

2 of 2 A

Form AEC 313 a
(3-56)
Part 1

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved.
Budget Bureau No. 38-R381

If byproduct material is for "human use" (internal administration of byproduct material, or the radiation therefrom to human beings), complete this supplement and attach to the application for byproduct material license.

1 (a) USING PHYSICIAN'S NAME
Department of the Army
Fitzsimons General Hospital
and USAMRNL

(b) NAME AND ADDRESS OF APPLICANT (If different from 1(a))
Denver, Colorado 80240

	CIRCLE ANSWER	
2 THE USING PHYSICIAN INDICATED ABOVE IS LICENSED TO DISPENSE DRUGS IN THE PRACTICE OF MEDICINE BY A STATE OR TERRITORY OF THE UNITED STATES, THE DISTRICT OF COLUMBIA, OR THE COMMONWEALTH OF PUERTO RICO.	YES	NO
Not applicable		
3 A STATEMENT OF USING PHYSICIAN'S CLINICAL RADIOISOTOPE EXPERIENCE (PAGE 3 OF THIS SUPPLEMENT) IS SUBMITTED IN SUPPORT OF THIS APPLICATION. IF ANSWER IS NO, USE PAGE 2 OF THIS SUPPLEMENT TO EXPLAIN OR REFER TO OTHER APPLICATION OR RELATED DOCUMENTS ON WHICH THIS INFORMATION APPEARS.	(YES)	NO

PROPOSED DIAGNOSIS OR TREATMENT

4 (a) DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED INCLUDING SPECIFIC CONDITIONS OR DISEASES TO BE DIAGNOSED OR TREATED (Use page 2 if necessary)

Refer to appended information (Incl 1)

(b) CHEMICAL FORM ADMINISTERED

Refer to appended information (Incl 1)

(c) DESCRIBE PROCEDURES WHICH WILL BE OBSERVED TO MINIMIZE HAZARD FROM HANDLING, STORAGE, AND DISPOSAL OF THE BYPRODUCT MATERIAL

Refer to appended information (Incl 1)

	CIRCLE ANSWER	
(d) DESCRIPTION AND SKETCHES OF SPECIAL DEVICES TO BE USED FOR ADMINISTERING BYPRODUCT MATERIAL TO HUMAN BEINGS ARE		
(1) ATTACHED (LITERATURE REFERENCES WILL SUFFICE) Refer to appended information	(YES)	NO
(2) ON FILE WITH THE ISOTOPES EXTENSION REFER TO APPLICATION NO 5-46-9, 5-46-10, 5-46-11, 5-46-12	(YES)	NO

5 PROPOSED DOSAGE SCHEDULE
(a) In millicuries for internally administered byproduct material other than discrete fixed sources; and in roentgens or rads, as appropriate, for internal or external irradiation from discrete fixed sources (gold seeds, cobalt needles, etc.) state separately for each condition or disease (use page 2 if necessary):

Refer to appended information

	CIRCLE ANSWER	
(b) INVESTIGATIVE PROPOSAL FOR EXPERIMENTAL, NEW OR UNUSUAL HUMAN USES IS ATTACHED. (Attachment should include outline of conditions to be evaluated, including data from animal studies and/or abstract of literature reference if any, number and type of patients (i. e. age group, moribund, etc.))	(YES)	NO

6 IF BYPRODUCT MATERIAL WILL NOT BE OBTAINED IN PRECALIBRATED FORM FOR ORAL ADMINISTRATION OR IN PRECALIBRATED AND STERILIZED FORM FOR PARENTERAL ADMINISTRATION, DESCRIBE IDENTIFICATION, PROCESSING, AND STANDARDIZATION PROCEDURES:

Not applicable

	CIRCLE ANSWER	
7 THE PROPOSED USE OF BYPRODUCT MATERIAL HAS BEEN, OR WILL BE, APPROVED BY THE MEDICAL ISOTOPE COMMITTEE	(YES)	NO

HOSPITAL FACILITIES FOR INDIVIDUAL PRACTICE USE ONLY

	CIRCLE ANSWER		
8 (a) THE APPLICANT HAS COMPLETED ARRANGEMENTS FOR A HOSPITAL TO ADMIT RADIOACTIVE PATIENTS WHENEVER ADVISABLE. Not applicable		YES	NO
(b) A COPY OF INSTRUCTIONS TO BE FURNISHED TO THE HOSPITAL AS TO RADIOLOGICAL SAFETY PRECAUTIONS TO BE TAKEN AND AVAILABLE RADIATION INSTRUMENTATION IS ATTACHED.		(YES)	NO

HUMAN USE

DIAGNOSTIC

RADIOISOTOPE	CHEMICAL FORM	APPLICATION	DOSE RANGE
I-131	Sodium iodide	Thyroid uptake	10-15 uc
		Thyroid scan	50-100 uc
		Checking metastases, thyroid cancer	100-1000 uc
	Serum albumin	Plasma volume	5-20 uc
		Placentogram	10-15 uc
		Brain tumor localization	10 uc/kg
		Cardiac output	20 uc
		Cardiac scan	10 uc/kg
	Hippuran	Renogram	10-50 uc
	Rose Bengal	Liver scan	10-uc/kg
		Liver function	10-20 uc
	Oleic Acid	Fat absorption	50-100 uc
	Triolein	Fat absorption	50-100 uc
	Cholegrafin (Iodipamide sodium)	Liver and gallbladder function	25 uc
	p-Toluidine polyvinyl pyrollidone	Protein loss	50-100 uc
		Brain scan	10 uc/kg
	Thyroxine	Thyroxine turnover	25-100 uc
	l-Monoiodotyrosine	Urinary excretion	10-25 uc
I-125	Sodium iodide	Thyroid uptake	25 - 50 uc
		Thyroid scan	50-100 uc
	Serum albumin	Plasma volume	5-20 uc
	Hippuran	Renogram	10-50 uc
		Renal Clearance	2-5 uc
	Rose Bengal	Liver function	10-20 uc
	Oleic acid	Fat absorption	50-100 uc
	Triolein	Fat absorption	50-100 uc
	Cholegrafin	Liver and gallbladder function	25 uc

Insert

RADIOISOTOPE	CHEMICAL FORM	APPLICATION	DOSE RANGE
I-125	Thyroxine	Thyroxine turnover	25-100 uc
	1-Monoiodotyrosine	Urinary excretion	10-25 uc
Cr-51	Sodium chromate	Red cell mass	25-50 uc
		G.I. bleeding	50-100 uc
		Red cell survival	50-100 uc
		Spleen scan	100-300 uc
	Chromic chloride	Plasma volume	10 uc
Co-57 or Co-58 or Co-60	Cyanocobalamin	Schilling test	0.5 uc
Au-198	Colloidal Gold	Liver scan	100-300 uc
Fe-59	Ferric chloride or Ferrous citrate	Iron turnover study	10-15 uc
Hg-203	Chlormerodrin	Kidney scan	150-300 uc
		Brain tumor scan	10 uc/kg
Hg-197	Chlormerodrin	Kidney scan	150-300 uc
		Brain tumor scan	10 uc/kg
H-3	H_3O-Tritiated water	Total body water	1-2 mc
Na-24	Sodium chloride	Total exchangeable sodium	50-100 uc
Se-75	Selenomethionine	Pancreatic scan	10 uc/kg
Xe-133	Xenon gas	Pulmonary function	0.5-1.0 mc
Sr-85	Strontium nitrate	Bone scan	25-100 uc

THERAPEUTIC

RADIOISOTOPE	CHEMICAL FORM	APPLICATION	DOSE RANGE
I-131	Sodium iodide	Hyperthyroid	3-20 mc
		Thyroid carcinoma	100-150 mc
		Cardiac diseases	5-30 mc
Au-198	Colloidal Gold	Malignant Effusions	50-150 mc
		Prostate cancer	25-100 mc
P-32	Soluble phosphate	Leukemia	5-10 mc
		Polycythemia vera	5-10 mc
		Bone metastases	2-5 mc
	Colloidal Chromic phosphate	Malignant effusion	5-15 mc

SEALED SOURCE

Sr-90	Strontium chloride	External therapy, sealed, source	25 mc

RADIOISOTOPE EQUIPMENT

NAME AND MODEL	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY
Spinco Survey Meter XX-2	2	beta, gamma	0.2 - 20mr/hr
Labitron - Nuclear Chicago 1619A	2	beta, gamma	0.5 - 20K CPM
Berkeley Decimal Scaler and Well 2001	1	gamma	
Picker Decode Scaler and Well C-TW-722	1	gamma	
Tracerlab Super Scaler and Detector P-20A	2	gamma	
Picker Dual Probe PX-4061	2	gamma	
Nuclear Chicago Scanner 1700P	1	gamma	
Henson Quartz Fiber Electroscope 1219	1	beta, gamma	10.5 r/div.
Admiral Corp. ANPDR-27 Geiger Müller	2	beta, gamma	0.5 - 500 mr/hr
Halliburton Corp. ANPDR-54 Meter	2	alpha	1-100K CPM
Radiac Meter IM-174/PD	1	gamma	0-500 r/hr
Tracerlab SU-1E	1	beta, gamma	0-15 mr/hr
Proteximeter 300	1	gamma	0-200 mr/hr
Siemens Meter	1	gamma	100-2000 r/hr
Tracerlab SU-5A	1	alpha,beta,gamma	0-40 mr/hr
Victoreen r meter with 5 chambers			0.25r - 2500r
Tracerlab SU-14	1	beta, gamma	0-25 mr/hr
Nuclear - Chicago 2612	1	beta, gamma	0-20 mr/hr
TMC. Spectrometer 5-13	1	gamma	
Packard TriCarb 314 EX	1	alpha, beta, gamma	
Tracerlab Versamatic Scaler & Probe SC-72	1	gamma	
Nuclear Chicago Gas Flow Detector D47	1	alpha, beta, gamma	
Tracerlab Monitor SU-3B	1	beta, gamma	CPM
Applied Physics Vibrating Reed Electrometer 32	1	alpha, beta, gamma	

Encl 3

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved
Budget Bureau No.

page may be completed by the physician's preceptor (if any) in the medical use of radioisotopes. When the information is furnished by the preceptor, the name and present address of the preceptor (if any) should be shown in item 12 below.

9 (a) USING PHYSICIAN'S NAME	(b) NAME AND ADDRESS OF APPLICANT (if different from 9(a))
John R. Handy	U. S. Army Med Rsch & Nutr Lab Fitzsimons GH, Denver 30, Colo.

10 CLINICAL TRAINING AND EXPERIENCE OF PHYSICIAN WHO WILL USE BYPRODUCT MATERIAL

(A) ISOTOPE	(B) CONDITION(S) DIAGNOSED OR TREATED	(C) NUMBER OF CASES	(D) TYPE OF PARTICIPATION FOR ALL CASES IN COLUMN B (circle applicable numbers of items in accordance with key set forth below)
I-131	Diagnosis of thyroid function	290	(1) 2 3 (4)
	Treatment of hyperthyroidism	11	(1) (2) 3 (4)
	Treatment of thyroid cancer	4	(1) (2) 3 4
	Treatment of cardiac conditions		1 2 3 4
	Brain tumor localization		1 2 3 4
	Blood determinations		1 2 3 4
	Kidney function		1 2 3 4
	Others: Renograms	6-7	(1) (2) 3 (4)
P-32 Soluble	Treatment of polycythemia and leukemia	4	(1) (2) 3 (4)
	Brain tumor localization		1 2 3 4
	Treatment of bone metastases		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
P-32 $CrPO_4$	Treatment of prostatic cancer		1 2 3 4
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
Au-198 Colloid	Treatment of prostatic cancer		1 2 3 4
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
Cr-51	Blood determinations	6-7	(1) (2) 3 (4)
	Others: Placentogram	1	(1) (2) 3 (4)
			1 2 3 4
Other Isotopes	Na - exchange Na	2	(1) (2) 3 (4)
	Fe-59 Ferrous kinetic study	1	(1) (2) 3 (4)
			1 2 3 4

Key to above numbers (column D)

Active Participation and Discussion in the:

1. Examination of patients to determine suitability for radioisotope diagnosis and/or treatment and recommendations on dosage to be prescribed.
2. Collaboration in calibration and administration of dosages including related measurements and plotting of data.
3. Active period of training and experience of sufficient duration to permit followup of patients through treatment and posttreatment period including reevaluation as to effectiveness and complications.
4. Study and discussion of case histories to establish most efficacious diagnostic and/or therapeutic techniques for this radioisotope use.

11. TOTAL NUMBER OF HOURS OF PARTICIPATION IN CLINICAL TRAINING 180 hours

12. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OR GUIDANCE OF

William H. Belerwaltes, M. D. Univ. Hospital, Ann Arbor, Michigan

Gerald L. DeNardo AT Fitzsimons General Hospital

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8. TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 *(Use supplemental sheets if necessary)*

	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL (Circle answer)
a. Practices of radiation	Univ of Michigan	1 mo	(Yes) No	(Yes)
b. Radioactivity measurement standardization and monitoring techniques and instruments	Univ of Michigan	1 mo	(Yes) No	(Yes) No
c. Mathematics and calculations basic to the use and measurement of radioactivity	Univ of Michigan	1 mo	(Yes) No	(Yes) No
d. Biological effects of radiation	Univ of Michigan	1 mo	(Yes) No	(Yes) No

9. EXPERIENCE WITH RADIATION. *(Actual use of radioisotopes or equivalent experience.)*

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
I^{131}	100-200 mc	Univ of Michigan	1 mo	Clin. Thyroid problems
P^{32}	5-10 mc	Univ of Michigan	1 mo	Treat. of polycythemia
Cr^{51}	50 uc	Univ of Michigan	1 mo	Blood Vol measurement
Na^{22}	?	Univ of Michigan	1 mo	Measure exchang. Na

10. RADIATION DETECTION INSTRUMENTS. *(Use supplemental sheets if necessary.)*

TYPE OF INSTRUMENTS *(include make and model number of each)*	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE *(mr/hr)*	WINDOW THICKNESS *(mg/cm²)*	USE *(Monitoring, surveying, measuring)*
	NA				

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE.

NA

12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED. *(For film badges, specify method of calibrating and processing, or name of supplier.)*

NA

INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS

13. FACILITIES AND EQUIPMENT. Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. *(Circle answer)* Yes No

NA

14. RADIATION PROTECTION PROGRAM. Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

NA

15. WASTE DISPOSAL. If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

U.S. Army Med Rsch & Nutr Lab
Fitzsimons General Hospital
Applicant named in item 1

Date _____

By: _____
MARION E. McDOWELL, Lt Col, MC
Commanding Officer
Title of certifying official

WARNING.—18 U. S. C., Section 1001, Act of June 25, 1948, 62 Stat. 749, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

Form AEC-313 a (3-56) Page 3

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved. Budget Bureau No. 38-R080.1

This page may be completed by the physician's preceptor (if any) in the medical use of radioisotopes. When the information is not furnished by the preceptor, the name and present address of the preceptor (if any) should be shown in item 12 below.

9 (a) USING PHYSICIAN'S NAME

PAUL E. SIKKERT, Major MC
Fitzsimons General Hospital

(b) NAME AND ADDRESS OF APPLICANT (If different from 9(a))

Denver 40, Colorado

10. CLINICAL TRAINING AND EXPERIENCE OF PHYSICIAN WHO WILL USE BYPRODUCT MATERIAL

(A) ISOTOPE	(B) CONDITION(S) DIAGNOSED OR TREATED	(C) NUMBER OF CASES	(D) TYPE OF PARTICIPATION FOR ALL CASES IN COLUMN D (circle applicable numbers of items in accordance with key set forth below)
I-131	Diagnosis of thyroid function	161	(1) (2) (3) (4)
	Treatment of hyperthyroidism	9	(1) (2) (3) (4)
	Treatment of thyroid cancer	9	(1) (2) (3) (4)
	Treatment of cardiac conditions	1	(1) (2) (3) (4)
	Brain tumor localization		1 2 3 4
	Blood determinations	22	(1) (2) (3) (4)
	Others:		1 2 3 4
			1 2 3 4
P-32 Soluble	Treatment of polycythemia and leukemia	9	(1) (2) (3) (4)
	Brain tumor localization		1 2 3 4
	Treatment of bone metastases		1 2 3 4
	Others: Eye Tumor Localization	2	(1) (2) (3) 4
			1 2 3 4
P-32 CPO_4	Treatment of prostatic cancer		1 2 3 4
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
Au-198 Colloid	Treatment of prostatic cancer	3	(1) (2) (3) (4)
	Treatment of cervical cancer		1 2 3 4
	Treatment of pleural effusions and/or ascites		1 2 3 4
	Others:		1 2 3 4
			1 2 3 4
Cr-51	Blood determinations	7	(1) (2) (3) (4)
	Others:		1 2 3 4
			1 2 3 4
Other Isotopes	Strontium 90	100	(1) (2) (3) (4)
	Cobalt 60 Schilling Test	23	(1) (2) (3) (4)
			1 2 3 4

Key to above numbers (column D) Active Participation and Discussion

1. Examination of patients to determine suitability for radioisotope diagnosis and/or treatment and recommendations on dosage to be prescribed.
2. Collaboration in calibration and administration of dosages including related measurements and plotting of data.
3. Active period of training and experience of sufficient duration to permit followup of patients through treatment and posttreatment period including reevaluation as to effectiveness and complications.
4. Study and discussion of case histories to establish most efficacious diagnostic and/or therapeutic techniques for this radioisotope use.

11 TOTAL NUMBER OF HOURS OF PARTICIPATION IN CLINICAL TRAINING 480 hours

12 THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OR GUIDANCE OF

H. F. Hurd, M. C.
Col. John A. Isherwood, M.C., AT Brooke General Hospital, Fort Sam Houston, Texas

(Name of physician (preceptor)) (Institution) (Signature)

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3-561
Page 4

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved.
Budget Bureau No. 38-R080.1

This page may be used for providing additional information.

Major Paul E. Siebert's training and experience has been reviewed by the Radioisotope Committee and he has been approved as a user of radioisotopes.

S/S

PHILIP A. BERGMAN
Colonel MC
Chairman, Radioisotope Committee

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 568572

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(3-56)
Page 3

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved.
Budget Bureau No. 38-R080

This page may be completed by the physician's preceptor (if any) in the medical use of radioisotopes. When the information is not furnished by the preceptor, the name and present address of the preceptor (if any) should be shown in item 12 below.

9 (a) USING PHYSICIAN'S NAME	(b) NAME AND ADDRESS OF APPLICANT (If different from 9(a))
Leon M. Dixon, Major, MC Fitzsimons General Hospital	Denver 40, Colorado

10 CLINICAL TRAINING AND EXPERIENCE OF PHYSICIAN WHO WILL USE BYPRODUCT MATERIAL

(A) ISOTOPE	(B) CONDITION(S) DIAGNOSED OR TREATED	(C) NUMBER OF CASES	(D) TYPE OF PARTICIPATION FOR ALL CASES IN COLUMN D (circle applicable numbers of items in accordance with key set forth below)
I-131	Diagnosis of thyroid function	250	(1) (2) (3) (4)
	Treatment of hyperthyroidism	11	(1) (2) (3) (4)
	Treatment of thyroid cancer	3	(1) (2) (3) (4)
	Treatment of cardiac conditions	1	(1) (2) (3) (4)
	Brain tumor localization	0	1 2 3 4
	Blood determinations	6	(1) (2) (3) (4)
	Others: Renograms utilizing Hippuric Acid	8	(1) (2) (3) (4)
	Liver study utilizing Rose Bengal	8	(1) (2) (3) (4)
P-32 Soluble	Treatment of polycythemia and leukemia	2	(1) (2) (3) (4)
	Brain tumor localization	0	1 2 3 4
	Treatment of bone metastases	3	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
P-32 $CrPO_4$	Treatment of prostatic cancer	2	(1) (2) (3) (4)
	Treatment of cervical cancer	2	(1) (2) (3) (4)
	Treatment of pleural effusions and/or ascites	2	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
Au-198 Colloid	Treatment of prostatic cancer	0	1 2 3 4
	Treatment of cervical cancer	3	(1) (2) (3) (4)
	Treatment of pleural effusions and/or ascites	2	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
Cr-51	Blood determinations	40	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
Other Isotopes	Co 60 Vitamin B 12 - Schilling Test	5	(1) (2) (3) (4)
	Intestinal Absorption - Oleic Acid, Triolein	10	(1) (2) (3) (4)
	Fe 59	3	(1) (2) (3) (4)

Key to above numbers (column D) Active Participation and Discussion

1. Examination of patients to determine suitability for radioisotope diagnosis and/or treatment and recommendations on dosage to be prescribed.
2. Collaboration in calibration and administration of dosages including related measurements and plotting of data.
3. Active period of training and experience of sufficient duration to permit followup of patients through treatment and posttreatment period including reevaluation as to effectiveness and complications.
4. Study and discussion of case histories to establish most efficacious diagnostic and/or therapeutic techniques for this radioisotope use.

11 TOTAL NUMBER OF HOURS OF PARTICIPATION IN CLINICAL TRAINING 1320 hours

12 THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OR GUIDANCE OF

Captain John Nagle, Chief, Radioisotope Section, Fitzsimons General Hospital AT Denver 40, Colorado

(Name of physician (preceptor)) (Institution) (Signature)

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UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved.
Budget Bureau No. 38-R080

This page may be used for providing additional information.

Major Leon M. Dixon's training and experience has been reviewed by the Radioisotope Committee and he has been approved as a user of radioisotopes.

S/S

PHILIP A. BERGMAN
Colonel MC
Chairman, Radioisotope Committee

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 568572

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UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A—HUMAN USE

Form approved.
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This page may be completed by the physician's preceptor (if any) in the medical use of radioisotopes. When the information is not furnished by the preceptor, the name and present address of the preceptor (if any) should be shown in item 12 below.

9 (a) USING PHYSICIAN'S NAME
Gerald L. DeNardo, Major, MC
Fitzsimons General Hospital

(b) NAME AND ADDRESS OF APPLICANT (If different from 9(a))
Denver 40, Colorado

10. CLINICAL TRAINING AND EXPERIENCE OF PHYSICIAN WHO WILL USE BYPRODUCT MATERIAL

(A) ISOTOPE	(B) CONDITION(S) DIAGNOSED OR TREATED	(C) NUMBER OF CASES	(D) TYPE OF PARTICIPATION FOR ALL CASES IN COLUMN D (circle applicable numbers of items in accordance with key set forth below)
I-131	Diagnosis of thyroid function	3000	(1) (2) (3) (4)
	Treatment of hyperthyroidism	60	(1) (2) (3) (4)
	Treatment of thyroid cancer	10	(1) (2) (3) (4)
	Treatment of cardiac conditions	4	(1) (2) (3) (4)
	Brain tumor localization	0	1 2 3 4
	Blood determinations	50	(1) (2) (3) (4)
	Others: Renograms (Hippuran)	250	(1) (2) (3) (4)
	Rose Bengal Liver Studies (over)	20	(1) (2) (3) (4)
P-32 Soluble	Treatment of polycythemia and leukemia	8	(1) (2) (3) (4)
	Brain tumor localization	0	1 2 3 4
	Treatment of bone metastases	15	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
P-32 $CrPO_4$	Treatment of prostatic cancer	0	1 2 3 4
	Treatment of cervical cancer	0	1 2 3 4
	Treatment of pleural effusions and/or ascites	5	(1) (2) (3) (4)
	Others:	0	1 2 3 4
			1 2 3 4
Au-198 Colloid	Treatment of prostatic cancer	0	1 2 3 4
	Treatment of cervical cancer	0	1 2 3 4
	Treatment of pleural effusions and/or ascites	5	(1) (2) (3) (4)
	Others:	100	(1) (2) (3) (4)
			1 2 3 4
Cr-51	Blood determinations	150	(1) (2) (3) (4)
	Others: Placentogram	5	(1) (2) (3) (4)
	Spleen Scan	5	(1) (2) (3) (4)
Other Isotopes	Co 57, 60 B12 Schilling	75	(1) (2) (3) (4)
	Fe 59, Ferrokinetics	50	(1) (2) (3) (4)
	Hg 203 Neohydrin Renal Scan	70	(1) (2) (3) (4)

Key to above numbers (column D) Active Participation and Discussion

1. Examination of patients to determine suitability for radioisotope diagnosis and/or treatment and recommendations on dosage to be prescribed.
2. Collaboration in calibration and administration of dosages including related measurements and plotting of data.
3. Active period of training and experience of sufficient duration to permit followup of patients through treatment and posttreatment period including reevaluation as to effectiveness and complications.
4. Study and discussion of case histories to establish most efficacious diagnostic and/or therapeutic techniques for this radioisotope use.

11. TOTAL NUMBER OF HOURS OF PARTICIPATION IN CLINICAL TRAINING 5000 hours and experience

12. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OR GUIDANCE OF
Captain Robert Abington, William Beaumont General Hospital, El Paso, Texas
Lt. Col. Harry Hurd, William Beaumont General Hospital, El Paso, Texas
Major Leon Dixon AT Fitzsimons General Hospital, Denver 40, Colorado
(Name of physician (preceptor)) (Institution) (Signature)

50689

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UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE

SUPPLEMENT A--HUMAN USE

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This page may be used for providing additional information.

I 131 Other Intestinal Absorption	500	(1) (2) (3) (4)
T3 Uptake	350	(1) (2) (3) (4)
Placentograms (Albumin)	30	(1) (2) (3) (4)
Polyvinylpyrrollidone	5	(1) (2) (3) (4)

Major Gerald L. De Nardo's training and experience has been reviewed by the Radioisotope Committee and he has been approved as a user of radioisotopes.

S/S

PHILIP A. BERGMAN
Colonel MC
Chairmay, Radioisotope Committee

U.S. GOVERNMENT PRINTING OFFICE: 1960 O - 568572

CURRICULUM VITAE

McDOWELL, Marion Edward Lt. Colonel, MC

Position: Commanding Officer, U.S. Army Medical Research & Nutrition Laboratory, Fitzsimons General Hospital, Denver 30, Colorado

Born: [redacted]

Married: [redacted]

Military Service:
Oakland Area Regional Hosp., - Ward Officer, 1946;
Med. Fld. Svc. School, Brooke AMC - Student Officer, 1946;
Fitzsimons Gen. Hosp. - Ward Officer, 1946-1948;
Univ. Rochester School of Med. & Strong Mem. Hosp. - Ass't. & Assoc. Res. in Med., 1948-1950;
Walter Reed Army Med. Center, AMS Grad. School - Internist, 1950-1954;
Walter Reed Army Inst. Res. - Director, Med. Div. 1954-1956;
U.S. Army Hosp., Tokyo - Ass't. Chief, Dept. Med. & Chief, Outpatient Service, 1956-1957;
U.S. Army Hosp., Tokyo - Chief, Med. Svc. - 1957-1958;
U.S. Army Hosp., Camp Zama, Japan - Chief, Outpatient Service, 1958-1959;
U.S. Army Med. Rsch & Nutr. Lab., FGH - Deputy Cmdr. & Chief, Metabolic Div., Sept. 1959-Aug. 1960;
U.S. Army Med. Rsch. & Nutr. Lab., FGH - Commanding Officer, Aug. 1960 to date.

Education:
Univ. of Wyoming - B.S. (with honor), 1942
Univ. of Rochester School of Med., - M.D., 1945
Diplomate of Am. Board of Internal Med., 11 Apr 1953

Specialty Training:
Univ. of Rochester School of Med. & Strong Mem. Hosp., Internship - 1945-1946
Univ. of Rochester School of Med. & Strong Mem. Hosp., Int. Med., Ass't, Residency - 1948-1949
Walter Reed Army Inst. of Res. - Management of Mass Casualties - 1 week 1955
Peter Bent Brigham Hosp., Boston, Mass. - Renal Disease & Use of the "Artificial Kidney" - 10 weeks 1950

Membership in Societies:
American Medical Association
Fellow of Am. Coll. Physicians
Am. Fed. Clin. Res.
Am. Soc. Artificial Internal Organs
Phi Beta Kappa
Sigma Xi

Consultant in Cardiology to Surgeon, Eighth U.S. Army and to Surgeon, U.S. Army, Japan, 1956-1959
Army Liaison Representative to:
Food and Nutrition Board, NRC-NAS, 1961 -
Nutrition Study Section, NIH 1961 -
Sub-Committee on Feeding & Nutr. in Space, NRC, 1962 -

McDOWELL, Marion E.

PUBLICATIONS

1. Estimation of Physical Fitness (abstract). Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu, Raymond Pearson, and Marion McDowell. Science 110:442, 1949.

2. Relationships of Availability of Oxygen to Physical Fitness in Patients with Cardio-respiratory Diseases. Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu and Marion McDowell. Proceedings of the Society for Experimental Biology and Medicine 73:212-216, 1950.

3. Ventricular Tachycardia during Cardiac Catheterization of Patient with Wolff-Parkinson-White Syndrome. Report of a Case Showing Effects of Atropine Sulfate. Robert A. Bruce, Paul N. G. Yu, Frank W. Lovejoy, Jr., Marion E.McDowell, and Raymond Pearson. Circulation 2:245-249, 1950.

4. Further Observations on the Pathological Physiology of Chronic Pulmonary Granulomatosis Associated with Beryllium Workers. Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu, Raymond Pearson and Marion McDowell. The American Review of Tuberculosis 62:29-44, 1950.

5. Normal Variations in End-tidal Air and Arterial Blood Carbon Dioxide and Oxygen Tensions During Moderate Exercise. Mitzi Suskind, Robert A. Bruce, Marion E. McDowell, Paul N. G. Yu and Frank W. Lovejoy, Jr. Journal of Applied Physiology 3:282-290, 1950.

6. Relationships of Vital Capacity and Ventilatory Measurements to Physical Fitness in Patients with Cardio-respiratory Diseases. Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu and Marion McDowell. Proceedings of the Society for Experimental Biology and Medicine 74:398-401, 1950.

7. Relationships of Mixed Alveolar-Arterial Oxygen and Carbon Dioxide Gradients to Exercise Performance in Patients with Diseases of the Heart or Lungs. Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu, Marion McDowell. (Abstract) The Journal of Clinical Investigation 29:800, 1950.

8. Variations in Electrocardiographic Responses during Exercise. Studies of Normal Subjects under Unusual Stresses and of Patients with Cardiopulmonary Diseases. Paul N. G. Yu, Robert A. Bruce, Frank W. Lovejoy, Jr., and Marion McDowell. Circulation 3:368-376, 1951.

9. Evaluation and Significance of Physical Fitness for Moderate Work. A Study of Patients with Cardiovascular or Pulmonary Diseases. Robert A. Bruce, Frank W. Lovejoy, Jr., Paul N. G. Yu, Marion McDowell. AMA Archives of Industrial Hygiene and Occupational Medicine 4:236-250, 1951.

10. The Artificial Kidney. Paul E. Teschan, and Marion E. McDowell. U. S. Armed Forces Medical Journal 3:391-400, 1952.

McDOWELL, Marion E.

11. The Effect of an Arteriovenous Fistula on Renal Hemodynamics and Electrolyte Excretion. Franklin H. Epstein, Robert S. Post and Marion McDowell. The Journal of Clinical Investigation 32:233-241, 1953.

12. The Renal Circulation. Marion E. McDowell. Medical Science Publication No. 3. Symposium on Circulation and Homeostasis (p. 166-179) Army Medical Service Graduate School, WRAMC, Oct. 1953.

13. Cardiac Output and Intracardiac Pressures in Patients with Arteriovenous Fistulas. F. H. Epstein, O. W. Shadle, T. B. Ferguson and M. E. McDowell. The Journal of Clinical Investigation 32:543-547, 1953.

14. Sodium Concentration Deficit: Nomogram for Replacement. A. V. Wolf and Marion E. McDowell. Journal of Applied Physiology 6:355-357, 1953.

15 Apparent and Osmotic Volumes of Distribution of Sodium Chloride, Sulfate and Urea A. V. Wolf and Marion E. McDowell. The American Journal of Physiology 176:207-212, 1954.

16. Renal Function in Epidemic Hemorrhagic Fever. Herman F. Froeb and Marion E. McDowell. The American Journal of Medicine 16:671-676, 1954.

17. Osmotic Volumes of Distribution. Idiogenic Changes in Osmotic Pressure Associated with Administration of Hypertonic Solutions. Marion E. McDowell, A. V. Wolf and Arthur Steer. The American Journal of Physiology 180:543,1955.

18. Clinicopathologic Conference, Tokyo Army Hospital: Numbness and Paralysis. Participants, Slater Dozier, Marion E. McDowell, Stewart Baker, Niklaus Keller, and Gian-Fortunat Hoessly. U. S. Armed Forces Medical Journal 10: 468-430, 1959.

19. Renal Residuals of Acute Epidemic Hemorrhagic Fever. Milton E. Rubini, Seymour Jablon, and Marion E. McDowell. A. M. A. Archives of Internal Medicine, In press.

20 Chapter 5: "Clinical Examinations - Military" in Chile: Nutrition Survey, March-June 1960. A report by the Intedepartmental Committee on Nutrition for National Defense, 1961.

21. Algae Feeding in Humans. Richard C. Powell, Elizabeth M. Nevels, and Marion E. McDowell. Journal of Nutrition: 75, 7-12, 1961.

22. A Study of the Digestibility and Acceptability of a New Dehydrated Ration. W. T. Nunes, R. C. Powell, E. M. Nevels and M. E. McDowell. U. S. Army Med Rsch & Nutr Lab Report #258, 1961.

23. Field Test of a High-Calorie, High Protein Beverage Powder for Use as a Ration Supplement at Forward Medical Stations, C. Frank Consolazio, Juan B. Torres and Marion E. McDowell. U. S. Army Med Rsch & Nutr Laboratory Report #263, 1961.

McDOWELL, Marion E.

24. Review of the U. S. Army's Irradiated Food Wholesomeness Program. Marion E. McDowell and Nicholas Raica (presented by Col. McDowell at the FAO-WHO-AEC Technical Meeting on the Evaluation of Wholesomeness of Irradiated Foods, Brussels, Belgium, 23-30 Oct 1961). U. S. Army Med Rsch & Nutr Lab Report #268, 1962.

25. Feeding Experiments with Algae, Marion E. McDowell and Gilbert A. Leveille. Federation Proceedings (in press) 1963.

26. The Soldier's Diet Under Cold Climate Conditions and The Soldier's Energy Requirements in Extremely Hot Conditions, Marion E. McDowell. (Presented at the 12th Annual SHAPE Medical Conference, Paris, 29 May 1963). SHAPE Medical Bulletin (in press) 1963.

CURRICULUM VITAE

Name: James H. Hansen, Lt. Colonel, MC, 062926

Position: Chief, Physiology Division, U. S. Army Medical Research and Nutrition Laboratory

Born: [redacted]

Married: [redacted]

Military Service: U.S.N.R. April 1944 to January 1946.
U. S. Army 15 June 1949 to present.
Rotating Internship, Letterman General Hospital, 1949-1950.
Staff, 118 General Hospital, Japan, six months, 1950-1951.
Residency, Internal Medicine, Letterman General Hospital, 1950-1953.
Assistant Chief Medical Service, USAH, Ft. Riley, 1953-1956.
32AAA Brigade Surgeon, London, England, 1956-1957.
Chief, Medical Service, 34 G Hospital, Orleans, France, 1957-1959.
"Advanced Course", Ft. Sam Houston, 1959.
Residency, Pulmonary Disease, Fitzsimons GH, 1960.
Staff and Chief TB Service, Fitzsimons GH, 1961-1962.
Chief, Mobile Med. Training Team to Jordan, six months, 1962.

Education: East Green Bay High School, Green Bay, Wisconsin, 1942.
St. Norberts College, West dePere, Wisconsin, 1943.
University of Wisconsin, 1944.
Marquette University, 1945.
M.D. - Johns Hopkins University School of Medicine, 1949.

Specialty Training: Residency, Internal Medicine, Letterman General Hospital, 1950-1953.
Residency, Pulmonary Disease, Fitzsimons General Hospital, 1960

Certification: American Board of Internal Medicine, 1956.
Pulmonary Diseases, 1962.

Membership in Societies: American Medical Association
American College of Physicians, Fellow, 1961
American Thoracic Society
American Association for the Advancement of Science

[illegible] B. Hansen

Publications:

(1) Diagnosis and Immediate Prognosis of Japanese B. Encephalitis, Am. J. Med. XII(3):277-288, March 1952. Co-author.

(2) Relapse of Vivax Malaria Treated with Primaquine and Report of One Case of Cyanosis (Methemoglobinemia) Due to Primaquine. Am. J. Med. Sciences, 227(1): January 1954. Senior Author.

(3) Staphylococcus Endocarditis. A Report of Three Cured Cases. Am. Heart Journal, 47(3):453-461, March 1954. Co-author.

(4) Endocarditis Due to Micrococcus Tetragenus. Ann. Int. Med., 40(6): June 1954. Senior Author.

(5) Fatal Hypersensitivity to PAS and Streptomycin. Dis. of Chest, XXVIII(5): November 1955. Senior Author.

(6) Paroxysmal Ventricular Tachycardia Associated with Myxedema. A Case Report. Am. Heart Journal 61(5): May 1961. Sole Author.

(7) Hypersensitivity to Isoniazid with Neutropenia and Thrombocytopenia. Am. Rev. of Respiratory Diseases, 83(5): May 1961. Sole Author.

CURRICULUM VITAE

BAUBERLICH, Howerde E., PL 313

Position: Chief, Chemistry Division

Born: [redacted]

Married:

Military Service: None

Education: Lawrence College, Appleton, Wisconsin - B.A., 1944
University of Wisconsin - M.S., 1946
University of Wisconsin - Ph. D., 1948

Specialty Training: University of Tennessee, Isotope Research, Oak Ridge Division - 1951, 4 months

Membership in Societies:

Am. Institute of Nutrition
Am. Soc. of Biological Chemists
Soc. of Am. Bacteriologists
Soc. for Exper. Biol. & Med.
Am. Chemical Society
New York Academy of Sciences
Am. Assn. for Cancer Research
Am. Soc. of Animal Production
Am. Soc. for Microbiology
Sigma Xi
Phi Beta Kappa
Gamma Sigma Delta (Hon. Agric. Soc.)
Am. Soc. for Clinical Nutrition

Honors:

Scholarship and Fellowship for graduate studies, University of Wisconsin, 1944
Jonathan-Bowman Fellowship for Cancer Research, 1944-48.
Meade Johnson Award, 1952
National Sci. Foundation Travel Award, 1952
Junior Chamber of Commerce Award, Auburn, Ala., 1952-53
Fellowship to attend Conference on Advanced Biochem. Use of Isotopes, 1954

PUBLICATIONS

(Dr. Howerde E. Sauberlich)

Author or co-author of over 60 publications in the fields of protein and amino acid metabolism, imbalances, toxicities, methodology and value as related to animal, human and microorganisms; lipid and carbohydrate metabolism; studies on the vitamin B-complex, especially pyridoxine, folacin, choline and biotin; kwashiorkor and nutritional edema; microbial irradiated foods; antibiotics and growth factors; enzymology; radio-isotopes, etc. Some of the more recent publications are as follows:

1. Baker, E.M., H.E. Sauberlich and S.J. Wolfskill. Metabolism of C^{14}-6-D-glucuronolactone and C^{14}-6-D-glucuronic acid in man. Fed. Proc. 20: 85, 1961.

2. Leveille, G.A. and H. E. Sauberlich. Influence of dietary protein level on amino acid requirement of the rat. Fed. Proc. 20: 370, 1961.

3. Sauberlich, H.E. and G. Guroff. Tracer studies on aspartic acid metabolism and interrelationships in certain lactic acid bacteria. Vth International Congress of Biochemistry, Moscow, U.S.S.R., August 1961 (Congress Abstracts, p. 280, 1961).

4. Leveille, G.A. and H.E. Sauberlich. Influence of dietary protein level on serum protein components and cholesterol in the growing chick. J. Nutrition 74: 500, 1961.

5. Leveille, G.A., J.W. Shockley and H.E. Sauberlich. Influence of the presence of cholesterol and fatty acids on plasma glyceride determinations on the chick. Poultry Sci. 40: 1361, 1961.

6. _____ The influence of cholesterol on the determination of serum glycerides. U.S. Army Med. Rsch. and Nutrition Lab. Rpt. #255, February 1961.

7. Leveille, G.A., H. E. Sauberlich and J. A. Edelbrock. The influence of enzyme supplementation on the digestibility of algae. USAMRNL Rpt. #259, June 1961.

8. Farish, Preston T., W. D. Salmon and H. E. Sauberlich. Effect of choline deficiency and ethionine feeding on nucleic acid content of rat livers. J. Nutrition 73: 23, 1961.

9. Sauberlich, H. E. Growth of rats fed protein-free diets supplemented with purified amino acid mixtures. J. Nutrition 74: 298, 1961.

Publications, Dr. Howarde E. Sauberlich

10. Sauberlich, H. E. Effect of vitamin B_6 on the growth of rats fed diets limiting in an essential amino acid and on the utilization of isomers of tryptophan, methionine and valine. J. Nutrition 74: 289, 1961.

11. Sauberlich, H. E. Studies on the toxicity and antagonism of amino acids for weanling rats. J. Nutrition 75: 61, 1961.

12. Leveille, G. A., H. E. Sauberlich and J. W. Shockley. The protein value and the amino acid deficiencies of various algae for growth of rats and chicks. J. Nutrition 76: 423, 1962.

13. Leveille, G. A., H. E. Sauberlich, R. C. Powell and W. T. Nunes. Influence of dietary protein on plasma lipids in human subjects. J. Clin. Inves. 41: 1007, 1962.

14. Leveille, G. A., H. E. Sauberlich and J. W. Shockley. The influence of dietary protein level on the essential amino acid requirement of the weanling rat. U. S. Army Med. Rsch. and Nutr. Lab. Rpt. #262, Sept. 1961.

15. _____ The sulfur amino acid requirement for growth of rats fed two levels of nitrogen. J. Nutrition 75: 455, 1961.

16. Leveille, G. A., J. W. Shockley and H. E. Sauberlich. Influence of dietary factors on plasma lipid relationships in the growing chick. Proc. Soc. Exp. Biol. Med. 108: 313, 1961.

17. _____ Lipid distribution in lipoproteins separated by polyanion precipitation. Proc. Soc. Exp. Biol. Med. 108: 544, 1961.

18. _____ Influence of dietary protein level and amino acids on plasma cholesterol of the growing chick. J. Nutrition 76: 321, 1962.

19. _____ Lipid content of chick erythrocytes and plasma. Proc. Soc. Exp. Biol. Med. 109: 345, 1962.

20. _____ The influence of dietary factors on plasma cholesterol of growing mice. U. S. Army Med. Rsch. and Nutr. Lab. Rpt. #265, January 1962.

Publications, Dr. Howarde E. Sauberlich

21. Baker, E. M., H. E. Sauberlich et al. Tracer studies of vita... C utilization in men; metabolism of D-glucuronolactone-6-C... D-glucuronic-6-C^{14} acid and L-ascorbic-1-C^{14} acid. Proc. Soc. Exp. Biol. Med. 109: 737, 1962.

22. Leveille, G. A., H. E. Sauberlich and R. D. Hunt. Effect of dietary lithocholic acid on liver size of the chick. Poultry Sci. (in press).

CIRRICULUM VITAE

Name: Kenneth Ellis Kinnamon, Captain, VC, 002030

Position: Chief, Radioisotope Laboratory (Primary MOS: 3200, Duty MOS: 3231)
Physiology Division, U. S. Army Medical Research and Nutrition Laboratory

Born: [redacted]

Married: [redacted]

Military Service: Direct Commission, 28 May 1959
Active Duty started in June 1959
Walter Reed Army Institute of Research from July 1959 to June 1960
University of Rochester, June 1960 to June 1961
USAMRNL, June 1961 to present

Education: Denison High School, Denison, Texas, 1951
B.S. Oklahoma State University, Stillwater, Oklahoma, 1955
D.V.M. Texas Agricultural and Mechanical College, College Station, Texas, 1959
M.S. University of Rochester, Rochester, New York, 1961

Specialty Training: Research Assistant (Sep 56 to Jun 59) to Dr. Sidney C. Brown, Supervisor of the Radio Biological Research Group at the Nuclear Science Center operated by the Texas Engineering Experiment Station for the Texas A & M College System.
Los Alamos Scientific Laboratory, Los Alamos, New Mexico, one week.
Sandia Base, Albuquerque, New Mexico, two weeks.
Nevada Test Site, Las Vegas, Nevada, one week.
National Reactor Test Site, Idaho Falls, Idaho, one week.
National Naval Medical Center, Bethesda, Maryland, three weeks.
Walter Reed Army Institute of Research, Washington, D. C., five weeks.

Membership in Societies: American Veterinary Medical Association

Publications: Rothstein, Nathaniel, Kinnamon, K.E., Brown, M.L. and Carithers, R.W.: Canine Microfilariasis in Eastern United States. Journal of Parasitology, Vol. 47, p. 661, 1961.

CURRICULUM VITAE AND BIBLIOGRAPHY

Name and Position: Herbert F. Johnson, Captain MC
Radiologist
Fitzsimons General Hospital
Denver 40, Colorado

Education: Duke University, 1950-1954 - A. B.
Duke University School of Medicine, 1954-1958 - M.D.

Internship: Womack Army Hospital, Fort Bragg, N. C., 1958-1959

Residency: University of N. C. Memorial Hospital, Chapel Hill, N. C., 1959-1962.

Experience: Radiologist, Fitzsimons General Hospital, Denver 40, Colo., 1962-Present

Professional Memberships: American Medical Association (Service)

Publications: Radium Therapy Appliance. Journal of Prosthetic Dentistry, Nov., Dec., Vol. II, 1961

Radioisotope Experience:

Test	Observed	Done Personally
I^{131} Uptake Studies	10	40
Blood Volume	3	6
R.C.M.	3	6
Circulation Times	2	8
Red Cell Survival (CR-54)	1	4
I^{131} Oleic and Lenoleic Fatty Acid Studies	5	20
Thyroid scan	5	30
Spleen Scan	3	2
Liver scan	3	8
Scan for metastatic thyroid to lungs	2	2
Renal Scan	8	20
Brain Scan	3	2
PBI^{131} Conversion Radio	2	0
I^{131}, Thyroid disease - benign	5	10
P^{32}, for polycythemia vera	1	2
P^{32}, for control of serous exudates	2	4

CURRICULUM VITAE AND BIBLIOGRAPHY

Name and Position: James A. Orbison, Colonel, MC
Chief, Department of Medicine
Fitzsimons General Hospital
Denver 40, Colorado

Education:
University of Denver, 1932-1933
University of Michigan, 1933-1940
A.B. Degree 1937 (Combined Curriculum)
M.D. Degree 1940

Internship: Harper Hospital, Detroit, Michigan, 1940-1941

Residency:
Internal Medicine: Oliver General Hospital, Augusta, Georgia, 1947-1949
Cardiovascular Disease: Walter Reed General Hospital, Washington, D. C., 1951-1952

Military Career:

1941-1943:	Fitzsimons General Hospital, Medical Service
1943 :	Medical Field Service School, Carlisle, Penn.
1943-1944:	Station Hospital, Carlisle Barracks, Ward Officer, Medical Service
1944-1945:	Clearing Company Officer, 6th Infantry Division (Luzon)
1945-1947:	Division Surgeon, 6th Infantry Division (Luzon and Korea)
1947-1949:	Oliver General Hospital Residency, Internal Medicine
1949-1950:	Oliver General Hospital, Chief, Outpatient Svc.
1950-1951:	Walter Reed General Hospital, Asst. Chief, Cardiovascular Service
1951-1952:	Walter Reed General Hospital, Resident in Cardiology
1952-1954:	U. S. Army Hospital, Ft. Belvoir, Va.
1954-1957:	U. S. Army Hospital, Nurnberg, Germany, Chief, Medical Service
1957-1960:	Madigan General Hospital, Chief, Cardiovascular Service
1960-1961:	Fitzsimons General Hospital, Chief, Department of Medicine
1961-1962:	Fitzsimons General Hospital, Chief, Cardiology Service
1962-Date:	Fitzsimons General Hospital, Chief, Department of Medicine
1960-Date:	Fifth Army Consultant in Cardiology and Internal Medicine

Professional Memberships:

Assistant Clinical Professor of Medicine, Medical College of Georgia, Augusta, Georgia, 1949-1950
Assistant Clinical Professor of Medicine, University of Colorado School of Medicine, 1960-Date.

Fellow, American College of Physicians
Senior Member, American Federation for Clinical Research
Fellow, American Medica Association
Fellow, American College of Cardiology
Fellow, American Heart Association (Member of Council on Clinical Cardiology)
Colorado Heart Association (Program Committee, Western Cardiac Conference, 1961-1962)

Publications:

CardiacTamponade Associated with the Administration of Dicumarol, (Co-Author) Circ. 1:1065, 1950
Amoebic Brain Abscess, Medicine, 30:247, 1951 (Senior Author)
An Epidemic of Rheumatic Fever in Japan and South Korea, Armed Forces Med. Journal 3:43, 1952 (Co-author)
Acquired Arteriovenous Fistulas Complicated by Endoarteritis and Endocarditis Lenta Due to Streptococcus Fecalis, New England Journal Medicine 250:305, 1954 (Co-author)
Clinical Experience with Sympathetic Blocking Agents in Peripheral Vascular Disease, Annals Int. Medicine 38:1245, 1953 (Co-author)
The Use of the Newer Antonomic Blocking Agents in the Study and Treatment of Peripheral Vascular Disease, Proc. Am. Fed. for Clin. Research, 1952 (Co-author)
A Standard Test for Peripheral Vascular Disease Utilizing the Oscillometric Response to Exercise, Second World Congress of Cardiology, Abs. - Read by Title, P. 534 (Co-author)
Heart Disease and Pregnancy, Medical Bulletin of the U. S. Army Europe, 12:222, 1955
Panhypopituitarism Following Epidemic Hemorrhagic Fever, Annals Int. Med. 43:1316, 1955.

CURRICULUM VITAE AND BIBLIOGRAPHY

Name and Position: Arthur Steer, Colonel MC
Chief, Pathology Service
Fitzsimons General Hospital
Denver 40, Colorado

Education: Cornell University, Ithaca, N. Y. - A. B. Degree
Washington University School of Medicine, St. Louis, Missouri, M. D. Degree.

Internship: Metropolitan Hospital, New York City, N. Y., 1932-1933.

Residency: Metropolitan Hospital, New York City, N. Y., 1933-1935, Obstetrics and Gynecology.

Experience: Private practice, 1935-1941
Milbank Memorial Fund Research Fellowship, 1935-1938
USPHS Research Fellowship, 1938-1941
Served as Chief of Laboratory Service of various hospitals in U. S. and China Burma India (CBI) theater overseas from 1941 to 1946
Fitzsimons General Hospital, 1946-1950
Japan, 1950-1953
Walter Reed Institute of Research, 1953-1958
Germany, 1958-1961
Fitzsimons General Hospital, 1961-Present

Professional Memberships: American Medical Association
Diplomate of the American Board of Pathology

Publications:

McDowell, M. E., Wolf, A. V., and Steer, A., Osmotic Volumes of Distribution; Idiogenic Changes in Osmotic Pressure Associated with Administration of Hypertonic Solutions, Am. J. of Physiology, 180:545-558

Speers, R. W., Katz, S., Parron, T. V., and Steer, A., Laboratory Findings in Epidemic Hemorrhagic Fever, J. Lab & Clin. Med., 46:28-40, Jul 55

Steer, A., Hullinghorst, R. L., and Mason, R. P., The Blood Program in the Korean War, Mil. Med., 117:415-426, Nov 55

Steer, A., Casualty Estimates in Nuclear Warfare, Mil. Med., Apr 56

Levenson, S. M., Upjohn, H. L., Preston, J. A., and Steer, A., Effect of Thermal Burns on Wound Healing, Ann. Surg 146: 357-368, Sep 57

Steer, A., Lindberg, R. B., Wiener, L. A., and Hunter, D. H., Serologic Diagnosis of Thphoid Fever in Previously Immunized Patient, Mil. Med. 125:822-827, Dec 60.

MEMBER, RADIOISOTOPE COMMITTEE, FITZSIMONS GENERAL HOSPITAL

Gerald L DeNardo, Major, M. C., 032537
Specialty - Internal Medicine
Position - Chief, Radioisotope Section

University of Santa Clara, Santa Clara, Calif., 1950-1953
University of California, Berkeley, Calif., 1953-1954, A.B. degree
University of California, San Francisco, Calif., 1954-1957, M.D. degree
Letterman General Hospital, San Francisco, Calif., 1957-1958, Internship
William Beaumont General Hospital, El Paso, Texas 1958-1961, Residency, Internal Medicine.
William Beaumont General Hospital, El Paso, Texas, September 1960-Sept. 1961, Radioisotope Training (4 months full time, 8 months halftime).
Fitzsimons General Hospital, Denver, Colorado., September 1961-present. Chief, Radioisotope Section, full time.

Full member, Society of Nuclear Medicine

CURRICULUM VITAE

Name and Position: Paul E. Siebert, Major MC
Chief, Radiology Service
Fitzsimons General Hospital
Denver 40, Colorado

Education: Washington University, St. Louis Mo. AB 1948
MD 1952

Internship: Valley Forge Army Hospital, Phoenixville Pa., 1952-1953.

Residency: Radiology, Brooke Army Hospital, Ft. Sam Houston, Texas, June 1954- 30 June 1957.

Experience: Basic Officers Course 801, MFSS, Ft. Sam Houston, Texas, 1953-1954.

USCGSC Ass. O. Course, Ft. Leavenworth, Kansas, January - May 1961.

Assistant Chief, Radiology, Tripler Army Hospital, APO 438, San Francisco, August 1957 - January 1961

Chief, Radiology Service, Martin Army Hospital, Fort Benning, Georgia, June 1961 - August 1962.

Assistant Chief, Radiology Service, Fitzsimons General Hospital, Denver, Colorado, August 1962 to present.

Professional Memberships: Diplomate American Board of Radiology, May 1958
Member Radiological Society of North America, Inc.
Treasurer, San Antonio Military Radiological Society, 1956-1957
Vice President Radiological Society of Hawaii, 1960
Member Society of Nuclear Medicine, Honolulu, Hawaii, 1960

Radioisotope Experience: Strontium^{90} Applications (1956-1960) 100.

OPERATIONS OF RADIOISOTOPE COMMITTEE
AND RADIOISOTOPE PROCEDURES

1. A Radioisotope Committee was established at Fitzsimons General Hospital by SO 192, 24 Sept., 1963, Fitzsimons General Hospital.

2. Copies of this order and curriculum vitae of the voting members are included.

3. Health Physicists are available on a consultation basis from the Office of the Surgeon General, and Colorado Medical School. Their assistance will be requested by the Isotope Committee when appropriate.

4. The Isotope Committee will act in accordance with the conditions and limitations on the General License Provisions of 10CFR Chapter 1, parts 30.32, 30.41, 30.43, 30.44, 30.51, 30.52, 30.61, 40.41, 40.61 - 40.63, 40.71, 40.81, 70.32, 70.51 - 70.56, 70.61, 70.62, 70.71 and Parts 20 and 31, published August 1, 1962 by Division of Licensing and Regulation, U.S.A.E.C., Washington 25, D.C.

5. No radioisotope shall be purchased or used without the prior approval of the Isotope Committee.

6. The Isotope Committee will only authorize the use of radioisotopes by an individual after due consideration of his clinical training and experience, his radioisotope training and experience and the safety of the proposed usage and dosage.

7. It is the purpose of the Isotope Committee to assure the maximum benefit and safety to all individuals participating in the application of radioisotopes to medical diagnosis, therapy and research.

8. The use of radioisotopes in humans shall be by, or under the direct supervision of a physician.

9. Byproduct material shall not be used in humans until its pharmaceutical quality and assay have been established.

10. Byproduct material shall not be used in field applications where activity is released.

11. Byproduct material shall not be used in products distributed to public.

12. Written administrative instructions covering radiological protection, control and security of byproduct material shall be followed and a copy of instructions shall be posted in the radioisotope section, and provided to each individual having responsibility for the use of such material ("Regulations and Rules Pertaining to the use of Radiomaterials in the Radioisotope Section", copy included).

13. Radioisotopes will be purchased and received by the Radiology Service, and Radioisotope Sections of Fitzsimons General Hospital and USAMRNL.

14. Radioactive wastes will be held in a shielded area in a locked room until decay to a safe level (10 half lifes). Liquid wastes may be disposed of through the sanitary sewer according to the requirements of 10 CFR, Chapter 1, Part 20.

15. All material employed will be procured in assayed forms, and stored in shipping containers, in lead containers procured for the purpose or behind lead bricks, and in accordance with instructions in 10 CFR, Chapter 1, Part 20 and U. S. Handbooks 48-51-59-65-69.

16. Laboratory areas will be monitored and wipe tested at one week intervals.

17. Personnel will wear radiological detection devices and exposure recorded.

18. Monitoring instruments will be calibrated at six month intervals.

19. The Radiological Safety Officer will conduct a regular program of inspection, and area and personnel monitoring. He shall be responsible to the Radioisotope Committee for the safe use of radioisotopes.

20. Strontium 90 applicators will be tested for contamination and/or leakage at intervals not to exceed six months. If this test reveals the presence of 0.005 microcuries or more of removable contamination, the licensee will immediately withdraw the sealed source from use, decontaminate, repair, or dispose of it in accordance with A. E. C. regulations. The person performing the test will be approved by the Isotope Committee which will assure that he has had experience in testing the sources.

21. In the event of an accident or other unusual occurrence, the A. E. C. will be notified in accordance with A. E. C. regulations. The Preventive Medicine Division of the Surgeon General's Office, Department of the Army, will also be notified. The Radiological Safety Officer will be responsible for appropriate action.

22. The Isotope Committee will meet quarterly or more frequently at the call of any of its members. A report of each meeting will be submitted in writing to the Commanding General, Fitzsimons General Hospital, and to the Office of the Surgeon General quarterly.

23. The Isotope Committee will perform the following:

(1. Supervise the entire radioisotope program.
(2. Review and grant permission for, or disapprove, the use of radioisotopes within the institution from the standpoint of radiological safety.
(3. Review the clinical training and experience and the

radioisotope training and experience of each prospective user.

(4. No prospective user will be designated to independently use byproduct material, who does not at least fulfill the minimum experience requirements recommended by the A.E.C.

(5. Each prospective user will be restricted to the use of those byproduct materials which his experience indicates he can utilize with safety.

(6. The Radioisotope Committee may, when necessary, extend the number and type of radioisotopes permitted to the user (within the limitations of the institutional license) as his experience increases.

(7. Review each proposed type of use including dosage, mode of administration, radiation, mode of handling, etc., to determine its safety and approve or disapprove the proposed use.

(8. Review reports and records of the radiological safety officer and enforce remedial action when necessary.

(9. Assure the adequacy and calibration of monitoring instruments, detection instruments, and other equipment necessary in the safe use of radioisotopes.

(10. Assure the proper and safe handling of radioisotopes.

(11. Assure the adequacy of laboratory facilities to facilitate the safe handling of radioisotopes including but not limited to hoods, ventilation, storage, shielding, temperature control, etc.

(12. Assure that adequate numbers of properly trained technicians are available for the proper use of radioisotopes.

(13. The Radiological Safety Officer will bring to the attention of the Committee unsafe practices in the use of radioactive material.

(14. The Radioisotope Committee will implement its duties and responsibilities through the authority of the Commanding General, Fitzsimons General Hospital and the Office of the Surgeon General.

FITZSIMONS GENERAL HOSPITAL
Denver, Colorado 80240

SPECIAL ORDERS
NUMBER 192

24 September 1963

E X T R A C T

1. TC 371. Fol orders REVOKED.
SMO: Para 9 SO 191 this Hq CS
Pert to: Grievance Panel to consider employee grievances relating to working conditions & appeals of employees who have been rated unsatisfactory.

2. TC 333. Fol indiv this sta auth to RATION SEPARATELY. READR. VOCG date cfm & eff date as indic in SNL.

DEAN, WILLIAM E	RA20750358	MSGT E7	AMEDS Co	11 Sep 63
GREEN, BAILEY L	RA18602801	SP5 E5	Do.	20 Sep 63

3. TC 221. Fol reassignment directed. WP TDN 2142010 01-1361 P1513 S99-999.

EBERHART, CHARLES E RA17591939 SP4 E4 P1 424.10 MHC (MD-3412) this sta
Asg to: 2d Admin Co 2d Inf Div Ft Benning Ga Aloc: Oct 63 CG USCONARC Lv data: 5 DDALV
PCS (MDC): C8 No yrs svc pay gr E4: 2 yrs Auth: VO C, OPO DA IA 9476-63 (EPADR-I) 20 Sep 63
ADC: 3 yrs BASD: 28 Apr 61 BPED: 28 Apr 61 ETS: 27 Apr 64 EDCSA: 5 Oct 63
Sp instr: WP 26 Sep 63.

4. TC 221. Fol reassignment directed. WP TDN PPSIA 2142010 01-1361-1362-1363-1364-1365-1366-1367 P1513 S99-999.

SIZEMORE, ROBERT G RA14351975 PSGT E7 111.70 (941.70) MHC (MD-3412) this sta
Asg to: US Army Tng Cen (Armor) (2018) Ft Knox Ky Aloc: Item 222 2d USA Feb 64 rqn
Lv data: 15 DDALV PCS (MDC): C8 Auth: OPO DA Msg 79433 (EPADS-G) dtd 20 Sep 63 ADC: 3 yrs
BASD: 17 Mar 50 BPED: 17 Mar 50 ETS: 1 Mar 65 EDCSA: 5 Oct 63
Sp instr: WP 26 Sep 63. For OJT & retention in MOS 941.70.

5. TC 222. Fol indiv this station having appeared before a PEB is ordered to place dsg to await final orders and disposition as directed by the Secretary of the Army. Members will proceed to place dsg and remain thereat to await further orders in connection with their physical evaluation board proceedings. TDN 2142010 01-1361 P1513 S99-999.

VESELY, DENNIS W US55676763 SP4 E4 911.27 MHC (MD-3412) FGH Denver Colo
Asg to: USVAH Madison Wis WP date: 26 Sep 63 HOR: 1015 W Carroll St Portage Wis
Pd: Until notified by receipt of final orders ACLV: 42 days PCS (MDC): C8
Auth: AR 635-40B & ASMRO Msg 19375 dtd 18 Sep 63 No yrs svc pay gr E4: 2 yrs
EDCSA: Will be established upon receipt of orders from The Adjutant General.
Sp instr: Govt veh trans WB furnished fr Fitzsimons Gen Hosp to coml carrier Denver Colo. TO will determine number of meal tickets & furn nec trans.

6. TC 222. Fol indiv this station having appeared before a PEB is ordered to place dsg to await final orders and dispostion as directed by the Secretary of the Army. Member will proceed to place dsg and remain thereat to await further orders in connection with his physical evaluation board proceedings. TDN PPSIA 2142010 01-1361-1362-1363-1364-1365-1366-1367 P1513 S99-999.

JONES, VIRGIL L RA14003498 SFC E6 635.60 MHC (MD-3412) FGH Denver Colo
Asg to: USVAH Tucson Ariz WP date: 1 Oct 63 HOR: 1876 S Michigan Way Denver Colo
Pd: Until notified by receipt of final orders ACLV: 47 days PCS (MDC): C8
Auth: AR 635-40B & ASMRO Msg 19380 dtd 19 Sep 63
EDCSA: Will be established upon receipt of orders from The Adjutant General. Sp instr: NA.

7. TC 370. Fol orders AMENDED.
SMO: Para 3 SO 191 this Hq CS
Pert to: Rsg of SIMON, JOSEPH A MN2304938 1ST LT ANC MHC this sta to Hq Comp this sta
As reads: SNL: "MN304938"
IATR: SNL: "MN2304938"

8. TC 217. Fol indiv returned this sta from AWOL and ASSIGNED as indic this sta eff on EDCSA having been dropped from rolls of organization indicated.

PODUNOVICH, RALPH JR RA16646242 PVT E1 951.10
Rel fr: NA Asg to: USA MP Det (MD-3412.01) DFR of: USA MP Det (MD-3412.01)
Eff date: 24 Sep 63 ADC: 6 yrs BASD: 14 Mar 60 BPED: 29 Jan 60 ETS: 5 Feb 69
EDCSA: 24 Sep 63

Over, SO 192, 24 Sep 63, FGH, Cont

Incl 2

9. TC 258. UP AR 614-60 fol indiv rel fr asg indic & rsg to MHC (MD-3412) this sta. All indiv pers records w/aprop rsg remarks WB fwd to gaining unit wi 48 hrs after rec of these orders. Indiv clo WB fwd IAW AR 735-2.

ANDREWS, EUGENE RA14375676 SP5 E5 Co A 5th Bn 2d Tng Regt (Basic) (5017) FLW Mo
Date hosp: 27 Jun 63 COA: 97 Maj Comd/agcy: Fifth US Army EDCSA: 29 Sep 63

10. TC 350. Following indiv this station APPOINTED.

Chief, Radiology Svc
Chief, Radioisotope Sec
Chief, Pathology Svc
Chief, Dept of Medicine
Post Radiation Safety Officer
Chief, Radioisotope Sec Physiology Div
Chief, Chemistry Division
Chief, Physiology Division
Commanding Officer, USAMR&NL
Chief, Purchasing & Contracting Branch Supply & Svc Div
Apt to: Radioisotope Committee Pd: Indef Purpose: Auth & Supervise isotope utilization
Auth: AR 40-37
Sp instr: Para 11 SO 81 this Hq CS is rescinded. The Senior Medical Officer present will act as committee chairman.

11. TC 370. Fol orders AMENDED.
SMO: Para 13 SO 238 this Hq dtd 29 Nov 62
Pert to: Designation of Property Book Numbers

IATA: Designation:	Property Book Number:
MEDICARE	2A8

FOR THE COMMANDER:

OFFICIAL:

PAUL A MAXSON
Major, MSC
Adjutant

Donald Bradlor

DONALD BRADLOR
Major, MSC
Asst Adjutant

DISTRIBUTION:

70 - Mil Pay Sec	1 - Cen Post Clnc	2 - Sup & Svc Div
10 - CO AMEDS Co	1 - Hsg Ofc	2 - JA
20 - Enl 201	2 - APO	2 - Adj
10 - Pnt Proc U	5 - Civ Pers	2 - XO
50 - CO MHC	1 - Str & Actg	
40 - Sep Sec	2 - Off 201	
10 - CO USA MP Det	5 - OMC	

20 - Sec conc (Para 10) 2 ea
5 - CO 2d Admin Co 2d Inf Div Ft Benning Ga (Para 3) (AIRMAIL) MR Purposes
5 - CG US Army Tng Cen (Armor) Ft Knox Ky (Para 4) (AIRMAIL) MR Purposes
4 - OPO DA Wash DC ATTN: EPADR-I (Para 3 & 4) (AIRMAIL)
5 - Director USVAH Madison Wis (Para 5) (AIRMAIL)
5 - Director USVAH Tucson Ariz (Para 6) (AIRMAIL)
5 - CO Co A 5th Bn 2d Tng Regt (Basic) FLW Mo (Para 9) (AIRMAIL) MR Purposes
8 - CG FLW Mo ATTN: ALWAG-TA (Para 9) (AIRMAIL)
2 - CG FLW Mo ATTN: ALWAG-AM (Para 9) (AIRMAIL)
2 - OPO DA Wash DC ATTN: EPECCA (Para 9) (AIRMAIL)

FITZSIMONS GENERAL HOSPITAL
Denver, Colorado 80240

HOSPITAL REGULATION
NUMBER 40-602

2 October 1963

MEDICAL SERVICE - RADIOLOGY SERVICE AND PROCEDURES

PROCUREMENT, RECEIPT AND ISSUE OF RADIOACTIVE ISOTOPES

1. Purpose. To establish policies, procedures and responsibilities for the procurement, receipt and issue of radioactive isotopes.

2. Procurement. All purchase requests will be reviewed and countersigned by the Radiological Safety Officer prior to purchase. An exception to this procedure is procurement of specific isotopes against previously established Blanket Purchase Requests submitted by the Fitzsimons General Hospital Radioisotope Section or the US Army Medical Research and Nutrition Laboratory. When the requirement exists, the chiefs of the respective isotope sections will notify the Radiological Safety Officer by telephonic communication.

3. Duty Hour Responsibilities.

a. Purchasing and Contracting Branch. Will insure that purchase order indicates whether consignee is USA MRNL or the Radioisotope Section, Radiology Service, Fitzsimons General Hospital, in order to expedite accurate and efficient delivery.

b. Transportation Branch. Upon notification, personnel of the Transportation Branch will pick up radioactive isotopes at the airport and deliver the unopened shipping container to the Storage Section, Supply Control Branch, for identification purposes. If the shipping container shows any evidence of damage, Transportation Service personnel will notify the Radiological Safety Officer, Extension 23239, immediately.

c. Storage Section, Supply Control Branch. Will determine whether the material is for USA MRNL or Radiosotope Section, Radiology Service. Upon determination, they will immediately deliver to Radiosotope Section or notify USA MRNL for immediate pickup. If USA MRNL cannot pick up material immediately, the Storage Section will deliver the items. The individual in USA MRNL or the Radioisotope Section who receives the radioactive isotopes will open the package and sign one copy of the billing document, returning the document to Storage Section personnel making the delivery. UNDER NO CIRCUMSTANCES WILL THE RADIOACTIVE ISOTOPE SHIPPING CONTAINER BE OPENED IN THE RECEIVING SECTION BY SUPPLY PERSONNEL.

d. Radioisotope Section and USA MRNL. Will be responsible for safe storage of radioactive isotopes. Personnel will maintain DA Form 8-235, (Pharmacy-Drug and Narcotic Stock Record), in accordance with paragraph 5, AR 40-61.

Incl 4

4. After Duty Hour Responsibilities.

a. The Administrative Officer of the Day, upon receiving a call from the airport, will arrange for pickup of radioactive isotopes and take the unopened shipping container to the Radium Room, Room 3125, Radiology Service, for safe storage until check-in can be accomplished. The AOD will notify Storage personnel, Supply Control Branch, Extension 22210, at 0745 hours the following morning that radioactive material has been received.

b. All radioisotopes must be placed in safe storage (Radium Room, Room 3125, Radiology Service) without delay, and under no circumstances will they be permitted to remain in any other area after arrival from the airport.

c. In the event of damage to the shipping container, action will b be taken as required in paragraph 2b, above.

5. References.

a. HR 40-604. c. AR 40-61. e. AR 711-16.

b. TB MED 249. d. AR 40-580. f. AR 725-50.

MEDEO-X

FOR THE COMMANDER:

Paul A. Maxson
PAUL A. MAXSON
Major, MSC
Adjutant

DISTRIBUTION:
"B"

FITZSIMONS GENERAL HOSPITAL
Denver, Colorado 80240

*HOSPITAL REGULATION
NUMBER 40-604

3 October 1963

MEDICAL SERVICE - RADIOLOGICAL SERVICES AND PROCEDURES

RADIOLOGICAL SAFETY

1. Purpose. To outline the duties and responsibilities of the Radiological Safety Officer at this installation.

2. Definition. The term "radiological" as used herein encompasses all forms of ionizing radiation (X-ray machines, radioisotopes, and other by-products and/or fissionable materials).

3. General. The Installation Commander is ultimately responsible for insuring safe usage, storage, and disposal of all sources of ionizing radiation and for enforcing measures as prescribed by The Surgeon General, Atomic Energy Commission, and other technical services. Specific references are cited in paragraph 5 and in various Department of the Army and SGO Circulars.

4. Responsibility. It will be the responsibility of the Radiological Safety Officer to advise the Commander on matters of radiation safety and to point out hazardous situations or practices contrary to accepted operative procedures and regulations. To fulfill this requirement, the Radiological Safety Officer has the authority to inspect any facility on this post where ionizing radiation hazards could exist. His specific duties are as follows:

a. Insure that a high level of instruction exists for new personnel relative to safe working practices.

b. Investigate the nature and degree of radiation injuries or abnormal exposure to determine the cause and make recommendations to prevent recurrence.

c. Observe operational procedures to insure that radiation exposure of personnel is kept as far below the permissible maximum as possible.

d. Assure that personnel monitoring devices are used where prescribed and that permanent records are kept of the results.

e. Assure that warning signs are in place when and wherever required.

f. Review and countersign procurement requests and maintain records of the amount and location of all sources of ionizating radiation, as outlined in paragraph 2, Hospital Regulation 40-602.

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*This Hospital Regulation supersedes HR 40-604, 11 July 1957.

g. Review radiation surveys and records of such surveys maintained in the isotope laboratories, including descriptions of recommended corrective measures.

h. Review protocols of radiosotope studies, procedures, or treatments at this installation.

i. Assay radiation hazard and give radiologic clearance prior to post-mortem examinations, or embalming by the mortician, in cases of all persons dying within six months after radioisotope therapy.

j. Call special meeting of the Isotope Committee of Fitzsimons General Hospital when discrepencies are uncovered in the handling of radioactive materials.

5. References.

a. Fed Reg, Vol 22 #19, Title 10, Chap I, Part 20.

b. TB MED 249.

c. TB MED 254.

d. AR 40-431.

e. AR 40-580.

f. AR 755-380.

MEDEO-X

FOR THE COMMANDER:

PAUL A. MAXSON
Major, MSC
Adjutant

DISTRIBUTION:
"B"

REGULATIONS AND RULES PERTAINING TO THE USE OF RADIOMATERIALS IN THE RADIOISOTOPE SECTION OF THE RADIOLOGY SERVICE, FITZSIMONS GENERAL HOSPITAL

I. Regulations.

A. Radiation Hazard Control.

1. The Chief of the Radioisotope Section will be responsible to the Radiological Safety Officer for the observance of radiation safety precautions by all personnel working in the Radioisotope Section, regardless of their individual duty assignments.

2. Permission to handle, adminster and/or assist in the administration of radiomaterials in the Radioisotope Section may be denied to or withdrawn from any person who, in the opinion of the Chief of the Radioisotope Section, is either inadequately trained in the handling of radiomaterials or is guilty of any breach of discipline as concerns the handling of radiomaterials so as to incur real or possible hazard to himself or others, pending review of the circumstances by the Radiological Safety Officer.

3. The rules listed hereinafter are to be observed. However, it is emphasized that mere following of the stated rules will not eliminate all possible hazards associated with the handling of radiomaterials. Copies of the following National Bureau of Standards Handbooks are available for additional guidance in order that individuals can better prepare themselves to cope with situations not specifically covered:

(a) Handbook #42 - Safe Handling of Radioactive Isotopes.
(b) Handbook #51 - Radiological Monitoring Methods and Instruments.
(c) Handbook #52 - Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water.
(d) Handbook #49 - Recommendations for Waste Disposal of Phosphorus-32 and Iodine-131 for Medical Users.
(e) Handbook #48 - Control and Removal of Radioactive Contamination in Laboratories.
(f) Handbook #56 - Safe Handling of Cadavers Containing Radioactive Isotopes.

B. Procurement, Storage and Administration of Radiomaterials.

1. All radiomaterials for use in the Radioisotope Section will be procured through the Supply Officer, Fitzsimons General Hospital.

2. The Supply Officer, Fitzsimons General Hospital, will be responsible for the handling of the contents of each shipment of a radiomaterial procured for the Radioisotope Section until such time as the shipment is delivered to the Chief of the Radioisotope Section or his designated representative.

3. The Chief of the Radioisotope Section will be responsible for the storage, handling and administration to patients of the contents of each shipment of a radiomaterial after it has been delivered to him or his designated representative in the Radioisotope Section, and, will be responsible for the maintenance of records pertaining thereto.

4. The Chief of the Radioisotope Section will be responsible for the handling and disposal of radioisotope-contaminated liquid wastes of the Radioisotope Section in accordance with the recommendations found in the National Bureau of Standards Handbooks concerning such matters. He also will be responsible for the handling and disposal of radioisotope-contaminated solid wastes.

II. Rules

A. Rules for All Personnel

1. In order to avoid undue exposure to ionizing radiations, unauthorized personnel will not enter the laboratory of the Radioisotope Section except when accompanied by an authorized person.

2. Only persons specifically authorized to do so by the Chief of the Radioisotope Section will handle any shipment of a radiomaterial or any part thereof after it has been delivered to the Radioisotope Section.

3. Only persons specifically authorized to do so by the Chief of the Radioisotope Section will prepare and/or administer a tracer and/or therapeutic dose of any radiomaterial after it has been delivered to the Radioisotope Section.

4. The door to the laboratory will be closed except when at least one authorized person is in the laboratory.

5. There will be no smoking, eating or drinking in the laboratory.

6 There will be no application of cosmetics in the laboratory.

7. There will be no storing of food and/or drink in the refrigerator in the laboratory.

8. No water for drinking purposes will be obtained from the laboratory.

9. The sinks in the laboratory will not be used for purposes of performing personal toilets except that the non-contaminated sink may be used for the purpose of hand-washing after the removal of rubber gloves by persons authorized to handle, administer and/or assist in the administration of radioisotopes.

B. Additional Rules for Personnel Authorized to Handle and Administer Radioisotopes

1. Radioisotope Section personnel authorized to handle, administer and/or assist in the administration of radiomaterials will wear film badges at all times, or, will wear other radiation detection devices such as a pocket dosimeter.

2. All personnel will wear laboratory coats while handling, administering and/or assisting in the administration of radiomaterials.

3. All personnel will wear gloves while handling, administering and/or assisting in the administration of radiomaterials, except that the containers of radiomaterials noted in Item No. (6) - (a) and (b) - below may be handled outside the laboratory without gloves.

4. All personnel will wear gloves and laboratory coats when reaching, with their hands or with remote-handling devices, inside the shielded area of the laboratory where radiomaterials are stored.

5. All gloves, protective clothing, instruments and glassware will be checked for radioisotope-contamination with a laboratory monitor after use, and, if contaminated, will be placed in the appropriate receptacle to await decontamination.

6. All radiomaterials will be stored, handled and administered in designated areas of the laboratory except that:

   (a) Samples containing less than 1.0 microcurie each may be taken into the sample counting room for counting;

   (b) Standards for studies may be taken into the patient counting rooms for counting;

   (c) Therapeutic and/or tracer doses of radiomaterials may be administered to patients on the wards or in the operating rooms with the knowledge and consent of the Chief of Radioisotope Section.

7. Glass shipping containers of radiomaterials will be stored in lead containers in the shielded area of the laboratory, with the exception of human serum albumin which will be refrigerated in a lead pig.

8. Long-handled tongs, short-handled tongs, forceps and other remote-handling devices will be used to handle containers of radiomaterials.

9. There will be no mouth pipetting under any circumstances.

10. Before placing radiomaterials in a container, the container will be clearly labelled to show the particular radioisotope, the concentration per unit volume expressed in microcuries or millicuries as of at least one particular time, and, the name or identifying initials of the person preparing the label.

11. Tracer and/or therapeutic doses of radiomaterials and samples for counting will be prepared and stored in the shielded area.

12. An aluminum or lucite syringe shield will always be used when injecting therapeutic solutions containing beta-emitting radioisotopes.

13. In the event of spill of a radiomaterial, hazard control is of first importance. In order to accomplish this, the person responsible for the spill should:

    (a) Be prepared to evaluate the hazard by knowing at all times which radioisotope is being handled and the approximate amount in microcuries or millicuries;

    (b) See that all personnel in the area are notified and leave the vicinity of the spilled radiomaterial without delay;

    (c) Determine the extent of personnel contamination by inspection and monitoring of involved personnel, calling for help as needed;

    (d) Remove contaminated protective and/or other clothing;

    (e) Rinse contaminated body parts with water (making use of the shower, either of the two laboratory sinks, or, the utility sink in the men's latrine as circumstances seem to warrant) and then wash with soap and water, monitoring after each washing;

    (f) Notify the Chief of the Radioisotope Section and Radiological Safety Officer as soon as possible.

14. In the event of spill of a radiomaterial, but only after the personnel contamination problem has been disposed of, decontamination of the area of spill will be carried out under the supervision of the Chief of the Radioisotope Section. As a general rule, the person responsible for the spill will be responsible for performing the work necessary to accomplish decontamination.

C. Any deviations from these rules will be with the prior approval of the Radiological Safety Officer.

U. S. ARMY MEDICAL RESEARCH AND NUTRITION LABORATORY
FITZSIMONS GENERAL HOSPITAL
DENVER, COLORADO

1 June 1963

PROCEDURES FOR USE OF RADIOACTIVE MATERIAL

References:

Title 10 C. F. R., Part 20
AR 40-414, 40-431, 40-440, 40-580, 40-582, 70-25, 385-30, 711-16, 755-380
TB Med 254
Cir 40-5
National Bureau of Standards Handbooks
- #42 Safe Handling of Radioactive Isotopes
- #47 Recommendations of the International Commission on Radiological Protection
- #48 Control and Removal of Radioactive Contamination in Laboratories
- #49 Recommendations for Waste Disposal of Phosphorus-32 and Iodine-131 for Medical Users
- #51 Radiological Monitoring, Methods and Instruments
- #52 Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water
- #53 Recommendations for the Disposal of Carbon-14 Wastes
- #56 Safe Handling of Cadavers Containing Radioactive Isotopes
- #59 Permissible Dose From External Sources of Radiation

SECTION I

GENERAL

1. The purpose of this memorandum is to insure the safe handling of all radioactive materials within the United States Army Medical Research and Nutrition Laboratory.

2. The Radiation Safety Officer shall have the responsibility for the enforcement of all phases of radiation safety within USAMRNL.

3. These procedures are published as a guide and must not be construed to be an amendment or change to any existing federal regulation, Army regulation, or local regulation governing the use of radioactive material.

SECTION II

ISOTOPE COMMITTEE

4. An isotope committee will consist of a minimum of four voting members and one non-voting member of supply and service. This committee will include the Chief of the Radioisotope laboratory, the Radiation Protection Officer, a qualified physician who has had adequate human radioisotope experience, and other well qualified persons in USAMRNL. The committee will be responsible for proper handling, storage, and disposal of radioactive materials. In addition, the committee will:

a. Recommend changes to the SOP concerning periodic monitoring and enforcement of safety measures in the handling of radioactive material.

b. Review and grant permission for, or disapproval of, the use of radioactive material.

c. Certify individual users for each type of procedure with each individual radioisotope and insure that a copy of such certification is placed in the appropriate users' 201 file. Current records of these approved users, documenting the qualifications and limitations of each, will be maintained.

d. Prescribe special conditions which may be necessary to include and give advice concerning proposed studies where it is needed.

e. Review records and receive reports from the Radiological Protection Officer and recommend corrective action when indicated.

f. Make recommendations for improvement of present laboratory facilities and for expansion of the laboratories in accordance with research needs.

g. Hold meetings at the call of the Chairman and report in writing the results of its deliberation to the Commanding Officer.

SECTION III

HAZARD CONTROL

5. The Chief of the Radioisotope Branch shall instruct, direct, and supervise all individuals working with or near radioactive materials in the observance of radiological safety.

6. Each individual working within or near radioactive material (or any employee who will possibly be exposed to ionizing radiation) will be issued a film badge. Before a film badge will be issued, each individual must read both CFR, Title 10, Part 10, and the laboratory SOP, and certify in writing that he has read and understands both.

7. Permission to handle, administer, or assist in the administration of radioactive materials under AEC general licensure in USAMRNL may be granted only by the Isotope Committee. This permission may be denied or withdrawn from any person who, in the opinion of the Isotope Committee or on the advice of the Radiation Safety Officer, is inadequately trained in the handling and use of radioactive materials, or is guilty of any breach of discipline as concerns the handling and use of radioactive materials so as to incur real or possible hazard to himself or others.

8. The safety rules listed hereinafter are to be observed. However, it is emphasized that mere following of the rules will not eliminate all possible hazards associated with the handling of radioactive materials.

9. The protection rules are based upon assumed long-term whole-body exposure to ionizing radiation by personnel whose duties involve regular handling of radioactive material or regular use of x-ray equipment. These rules apply to all persons occupationally employed using any source of ionizing radiation in a controlled area or those incidentally exposed as a result of such use, under any condition. A controlled area is one in which the occupational exposure of personnel to radiation or to radioactive material is under the supervision of a Radiation Protection Officer. (This implies that a controlled area is one that requires control of access, occupancy and working condition for radiation protection purposes.)

SECTION IV

PROCUREMENT, STORAGE, AND ADMINISTRATION

10. All radioactive materials for use in USAMRNL will be procured through the Radioisotope Branch by the Supply Officer, USAMRNL.

11. The Supply Officer, USAMRNL, will be responsible for the storage and handling of the contents of each shipment of radioactive material until such time as the shipment is delivered to the Chief, Radioisotope Branch, who will be responsible for the maintenance of records pertaining thereto.

12. The Chief of the Radioisotope Branch will direct the storage and handling of the contents of each shipment of radioactive material after it has been delivered to him or his designated representative in the Radioisotope Laboratory, and will be responsible for the maintenance of the records pertaining thereto.

13. The storage area will be neat and segregated by type emission. Gamma emitting isotopes will be stored so that the radiation level at the edge of the storage area does not exceed 2 mr/hr.

14. The Chief of the Radioisotope Branch will be responsible for the handling and disposal of radioisotope-contaminated liquid and solid wastes of theRadioisotope Laboratory in accordance with the recommended procedures found in Part 20, Title 10 and Army regulations concerning such matters.

SECTION V

SAFETY RULES

15. In order to avoid undue exposure to ionizing radiation, unauthorized personnel will not enter the Laboratory of the Radioisotope Branch except when accompanied by an authorized person.

16. Only persons specifically authorized to do so by the Chief of the Radioisotope Branch will handle any shipment of radioactive material or any part thereof after it has been delivered to the Radioisotope Branch.

17. Only persons specifically authorized to do so by the Safety Committee and/or under the supervision of the Chief of the Radioisotope Branch will prepare or administer a dose of any radioactive material after it has been delivered to the Radioisotope Laboratory.

18. In all rooms where radioactive materials are being used, the following regulations shall be in effect:

a. There will be no eating or drinking, and no application of cosmetics.

b. Smoking is not permitted while active material is being handled.

c. There will be absolutely no mouth pipetting of radioactive material in the laboratory under any circumstances.

d. Under no circumstances will radioactive waste be handled or disposed of by the janitorial staff.

e. Rubber gloves will be worn at all times when radioactive material is being handled. (Except sealed, or capped containers of radioactive materials in the amounts listed under Group I of Appendix #1).

f. All gloves, protective clothing, instruments, and glassware will be checked for radioactive-contamination with a laboratory monitor after using, and, if contaminated, will be placed in the appropriate receptacle to await decontamination.

g. All contaminated glassware, instruments, pipettes, and waste incurred in any radioisotope experiment or study will be policed and placed in an appropriate receptacle or sink by the persons performing the experiment or study.

h. At the end of each work period the hands shall be carefully washed and tested for contamination with an instrument of suitable sensitivity.

i. Before placing radioactive material in any container, the container will be clearly labeled with radioactive caution tape of yellow and magenta to show the particular radioactive material, the concentration in microcuries or millicuries per unit volume weight as of some particular date, and the identifying initials of the person preparing the material.

j. Work surfaces will be covered with absorbent paper. The work in hoods will be similarly performed with absorbent paper. The work bench will be equipped with wiping papers for the prompt removal of spills.

k. When using radioactive material, special equipment suitable for the type and level of activity being used will be used for each type of operation. This will include handling tools such as tongs, forceps, trays, and mechanical holders. When the isotopes concerned are primarily beta emitters, efficient use can be made of transparent plastic shields. Containers for liquid samples will be reinforced by an outer unbreakable container.

l. No individual shall knowingly expose himself, or cause others to be exposed, to more than 0.02 rem in any working day.

m. All laboratory operations with more than low level activity will be conducted in hoods.

SECTION VI

RADIOACTIVE WASTE

19. The sinks in the laboratory portion of the Radioisotope Laboratory will not be used for purposes of performing personal toilets, except that the non-contaminated sinks may be used for the purpose of hand washing after the removal of rubber gloves.

20. No water for drinking purposes will be obtained from the laboratory portion of the Radioisotope Branch.

21. The Radiation Safety Officer is responsible for the disposal of all radioactive waste within USAMRNL. Such disposal shall be accomplished under all existing regulations listed in Part 20 Title 10, NBS Handbooks, and Army Regulations.

22. For persons other than Radioisotope personnel:

a. Solid radioactive waste shall be placed in waterproof disposable containers and deposited in the container marked with a Radiation Caution symbol and wording "Danger Radioactive Material". The radiation level outside the receptacle should not exceed 1.0 milliroentgens per hour. When full, the bag will be labeled as to content, isotope present, approximate amount in microcuries (or millicuries) and the date. These waste bags will then be collected by personnel of the Radioisotope Branch.

b. All liquid wastes shall be placed in appropriate containers and marked with radioactive caution tape as to isotope content, approximate amounts (in microcuries or millicuries), and the date of collection. This contaminated liquid waste will then be delivered to the Radioisotope Laboratory for disposition.

c. Carcasses of animals containing radioactive material will be marked with radioactive caution tape and delivered to the Radioisotope Laboratory in a container properly marked as to date, isotope content, and approximate amounts in microcuries or millicuries.

d. Fecal material containing radioactive material similarly will be marked with radioactive caution tape, marked as to date, isotopic content, and approximate activity and delivered to the Radioisotope Laboratory.

SECTION VI

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b. All liquid wastes shall be placed in appropriate containers and marked with radioactive caution tape as to isotope content, approximate amounts (in microcuries or millicuries), and the date of collection. This contaminated liquid waste will then be delivered to the Radioisotope Laboratory for disposition.

c. Carcasses of animals containing radioactive material will be marked with radioactive caution tape and delivered to the Radioisotope Laboratory in a container properly marked as to date, isotope content, and approximate amounts in microcuries or millicuries.

d. Fecal material containing radioactive material similarly will be marked with radioactive caution tape, marked as to date, isotopic content, and approximate activity and delivered to the Radioisotope Laboratory.

23. Radioisotope Personnel:

RADIOACTIVE WASTE WILL BE DISPOSED OF ONLY BY PERSONNEL OF THE RADIOISOTOPE LABORATORY

Liquid:

a. Liquids containing short lived radioisotopes will be held in storage until the activity is essentially background. (The material will be stored in such a way that the radiation level outside the storage area will not exceed 1.0 milliroentgen per hour.)

b. All contaminated liquid waste may be disposed of in the "hot" sink provided the quantity which, if diluted by the average daily quantity of sewage (sanitary sewage flow per 24 hours is 475,000 gallons) released into the sewer by the licensee, will not result in an average concentration in excess of values specified in Appendix B, Table I, Column 2 of CFR, Title 10, Part 20; or

c. Ten times the quantity of such material specified in Appendix C of same; and

d. The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of same; and

e. The gross quantity of licensed and other radioactive material released into the sewage system by the licensee does not exceed one curie per year.

f. All liquid wastes which are held for decay must be placed in appropriate containers and marked as to isotope content, approximate amounts, and the date of collection. The radiation level outside the storage area will not exceed 1.0 milliroentgens per hour.

g. Solid radioactive waste shall be stored in such a way that the radiation level outside the storage area will not exceed 1.0 milliroentgens per hour.

h. Since authorization has been granted to dispose of Carbon-14 by incineration, solid C-14 waste and solid non-Carbon-14 waste will be maintained separately to facilitate later disposal by different means.

i. All clothing that is known or suspected of being contaminated with a short half-life radioactive isotope or long

half-life isotope will be placed in separate container and later destroyed or decontaminated as determined by the Radiation Safety Officer.

j. Disposal of non-Carbon-14 solid radioactive waste will be carried out under the direction of:

Chemical, Biological, Radiological Agency
ATTN: Chief, Nuclear Activities Division
Edgewood Arsenal
Army Chemical Center, Maryland

Under no circumstances will non-Carbon-14 waste be incinerated.

k. Carbon-14 waste will be disposed of as stated in "j" above or by incineration and shall not exceed the limits specified in Appendix B, Table II, CFR, Title 10, Part 20.

SECTION VII

DECONTAMINATION OF GLASSWARE

24. All glassware which is utilized directly with radioactive material shall be deemed "contaminated". The decontamination of such glassware is important not only in the interests of radiation safety but also in the unintentional invalidation of additional experimental data.

25. Contaminated glassware will be placed in a "hot" sink where it will be immediately rinsed and then undergo continuous washing. As required, the glassware will be washed in detergent and rinsed in hot water. The wash and rinse cycle will be repeated until three washings have been completed. Washed glassware may be oven or air dried.

26. Pipettes will be rinsed immediately after use and placed in a pipette soaker containing detergent. Washing shall be done by continuous washing in a pipette washer for a minimum of two hours.

27. Syringes shall be disassembled when placed in the sink. As required, syringes will be washed, dried, and monitored before return to central material or put into reuse. When possible the use of disposable syringes and needles is suggested.

28. All glassware which has been decontaminated from gamma radiation will be monitored by an appropriate detector of suitable sensitivity to prevent recontamination during another course of study or experiment. Always monitor <u>after drying</u>, <u>never wet</u>.

Decontaminated glassware for low energy beta radiation will be periodically spot checked by the Radioisotope Branch.

29. All glassware which upon monitoring proves to be still contaminated will immediately be placed back into the appropriate washing cycle. If the monitoring again indicates any level of radioactivity, the glassware shall be delivered to the Radioisotope Laboratory for further decontamination.

SECTION VIII

RADIOACTIVE SPILL

30. All radioactive material, when spilled, constitutes a hazard, either to personnel or to equipment. If a spill of radioactive material occurs in Group I (Appendix #1) turn off all fans in the immediate area and notify all other personnel in the controlled area. If the spill is liquid, drop absorbent paper on the spill and mark off the area with chalk or cord. If the spill is dry, proceed in the same manner, but convert the dry spill to liquid spill by applying wet absorbent paper over the area.

31. If a spill of radioactive material occurs in Group II (Appendix #1), hazard control is of first importance. In order to accomplish this, the person responsible for the spill will:

a. Notify the Radiation Safety Officer or his designated representative.

b. Be prepared to evaluate the hazard by knowing at all times which radioisotope is being handled, its chemical form, and the approximate amount being used (in millicuries or microcuries).

c. See that all personnel in the area are notified and that they leave the immediate area of the spill without delay.

32. In the event of a spill of radioactive material in Group III (Appendix #1), the procedure listed above in "a", "b", and "c" should be carried out, plus the following:

a. Determine the extent of personal contamination by inspection and monitoring of the involved personnel.

b. Remove contaminated clothing.

c. Rinse the contaminated body parts with water (making use of the sinks located in the area or the emergency shower if the

spill took place in the high level room of the Radioisotope Laboratory), and then wash with soap and water, monitoring the contaminated body part after each washing.

33. Decontamination of the area of the spill will be carried out under the supervision of the Radiation Safety Officer, but only after the personnel contamination problem has been disposed of. As a general rule, the work associated with the decontamination is performed by the person responsible for the spill.

34. If ingestion or inhalation is suspected from a spill of radioactive material in Group III, AR 40-581 will be complied with, and the following will be accomplished by the Radiation Safety Officer:

a. Evacuate the area of the original contamination.

b. Personal decontamination will be carried out by washing external parts to prevent additional exposure or ingestion.

c. Decontaminate the film badge (when necessary) and forward it by Air Mail Special Delivery to the Lexington Signal Depot; Lexington, Kentucky, with all data concerning the incident (i.e., isotope and its chemical form, amount ingested, date, names, etc.).

d. Carry out all routine decontamination of clothing, work spaces, etc., which were involved.

e. Notify The Surgeon General, Department of the Army, Washington 25, D. C., ATTN: MEDCE-OH, by telegram, of possible internal exposure. Complete DA Form 285 (Accident Report).

f. Notify The Surgeon General, Department of the Army, Preventive Medicine Division, by telephone, of:

(1) Time and date of exposure.
(2) Millicurie strength of isotope and its chemical form.
(3) Name of individual and treatment already undertaken.

g. A 24-hour urine sample will be collected under the direction of the Radiation Safety Officer from the person concerned. The collection shall be in a polyethylene liter bottle which will have a card attached containing the following data:

(1) Name, rank, and serial number
(2) Date of incident
(3) Collection dates
(4) Isotope and chemical form

h. Samples will be held until further instructions are received from The Surgeon General. If so directed, forward to:

U. S. Army Environmental Hygiene Agency
ATTN: Radiological Hygiene Division
Edgewood Arsenal, Maryland

i. If overexposure occurs, DD Form 1141 (Report of Exposure to Ionizing Radiation) must be completed in accordance with AR 40-431.

SECTION IX

RADIATION SAFETY MONITORING

35. Area Monitoring:

a. Routine monitoring will be accomplished according to the following time schedule:

weekly

(1) Radioisotope Laboratory (according to diagram in Appendix 2).

monthly

(1) USAMRNL (according to diagrams in Appendix 2).
(2) Samples, both raw and processed, from the Post sewage plant. (To be counted in the liquid scintillation counter.)
(3) Blowers on roof of Radioisotope Laboratory.

quarterly

(1) Outside areas within the region of USAMRNL and FGH.

b. Other areas will be monitored when deemed necessary by the Radiation Safety Officer.

c. Readings obtained during the surveys will be recorded and retained as a permanent record.

d. Routine monitoring in USAMRNL (including blowers on roof of Radioisotope Laboratory) will be done using a portable GM counter, and if any gamma reading exceeds a value of 2.0 milliroentgens per hour, the Radiation Safety Officer will be notified. The area will be marked as to reading in milliroentgens/hour and the working time limit.

e. Swipe tests will be routinely conducted and when contamination is suspected. The swipes will be counted in the liquid scintillation counter. Any activity above background will be considered a contaminated area. Readings obtained will be recorded and retained as a permanent record.

f. Any areas of previously undetected contamination will be promptly removed by those persons responsible for the contamination, under the supervision of the Radiation Safety Officer.

g. Furthermore, outside areas within the region of USAMRDL and FGH will be monitored, using a numbered map, by counting grass in the liquid scintillation counter. Samples, both raw and processed, from the Post sewage plant also will be counted in the liquid scintillation spectrometer.

36. Personnel Monitoring:

a. Film badges are provided for persons working with radioactive material in USAMRNL. These film badges will be worn during normal working hours and are not to be removed from USAMRNL. Care of the film badge will be the responsibility of the individual user.

b. Badges will be collected monthly by the Radioisotope Laboratory personnel. The collected badges will be sent to Lexington Signal Depot, Lexington, Kentucky for processing and reading. The returned values will be permanently recorded in Radioisotope Branch files on AEC Form Nos. 4 & 5 and DD Form 1141.

c. A thorough medical examination should be made of each individual potentially exposed to significant amounts of radiation before employment and annually thereafter.

d. Those persons working with millicurie amounts of Tritium shall have periodic urine checks for radioactivity.

SECTION X

LOGS AND RECORDS

37. AEC Form 3 (Notice to Employees - Standards for Protection Against Radiation) must be posted in a conspicuous location.

38. AEC Forms 4 and 5 (History of Exposure and Record of Exposure to Ionizing Radiation) will be kept. This record will also be entered on DD Form 1141 in accordance with AR 40-43.

39. The USAMRNL SOP will be posted and the AEC licenses will be readily available.

40. Radioisotope inventory balance will be determined monthly. (Radioisotope inventory records are kept on Forms DA 8-235 and DA 8-212.)

41. Instrument logs will be maintained indicating calibration and maintenance of the portable survey instruments.

42. Records of surveys (including wipe tests) will be kept.

43. Caution signs, labels, and signals will be utulized according to CFR, Title 10, Part 20, para. 20.203.

*44. A report covering the period of each calender quarter will be prepared by the Commander of USAMRNL. This report will be dispatched to The Surgeon General, ATTN: MEDPS-PO, by the fifteenth working day following the close of the report period and will contain the following information as a minimum:

a. Copy of minutes of each Radioisotope Committee meeting, including a record of all actions taken by the Committee.

b. Copy of the training and experience of each newly approved user of radioisotopes or any change in qualifications or certifications of previously approved user (for human use, AEC Form 313a, page 3).

c. Radioisotope inventory, including data on quantities of radioisotopes procured, used, or disposed of, or currently in storage.

d. List of procedures with dosage for each radioisotope used in humans during the reporting period.

e. Information on unsolved problems, new or improved developments, or other comments of interest to, or having a bearing on, support rendered by The Surgeon General.

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* Effective only upon receipt of implementing instructions from The Surgeon General.

SECTION XI

OTHER ROUTINE LABORATORY PROCEDURES

45. Neatness in the laboratory is a prime requisite for elimination of the spread of contamination. The work area should be free of equipment and materials not required for the experiment at hand, and equipment used will be decontaminated and stored in a controlled location after use.

46. Floors in the Radioisotope Laboratory should be cleaned daily by wet mopping. Brooms and mops will not be transferred to other areas unless they are free from radioactive contamination.

47. Table tops, equipment, or any surface within the Radioisotope Laboratory will be kept clean. Under no circumstances will there be an accumulation of dust and/or possible contamination.

48. Floors will be waxed and buffed on a monthly basis.

49. The gamma ray spectrometer filter, the liquid scintillation counter filter, air conditioner filters, glove box filters, and hood filters will be checked quarterly and properly cleaned or replaced when necessary.

50. Desiccant in the liquid scintillation counter will be checked weekly and changed when necessary.

51. The emergency shower will be checked weekly.

52. The survey meters will be calibrated at least every six months and after every maintenance procedure or battery change.

53. Batteries in the survey meters will be checked monthly, and changed when necessary.

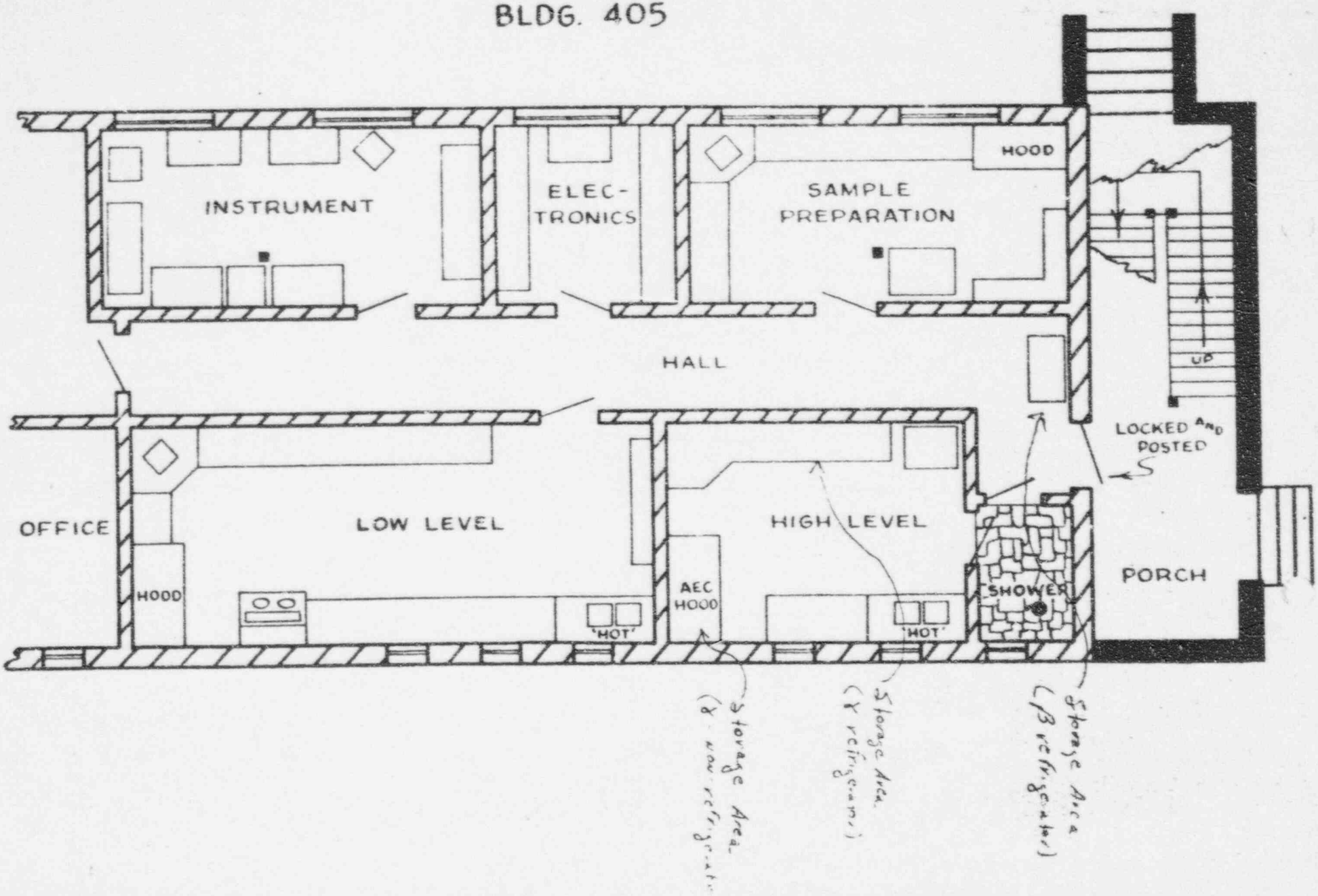
-SAFE HANDLING LEVEL FOR RADIOISOTOPES-
Authorized For Use In USAMRNL

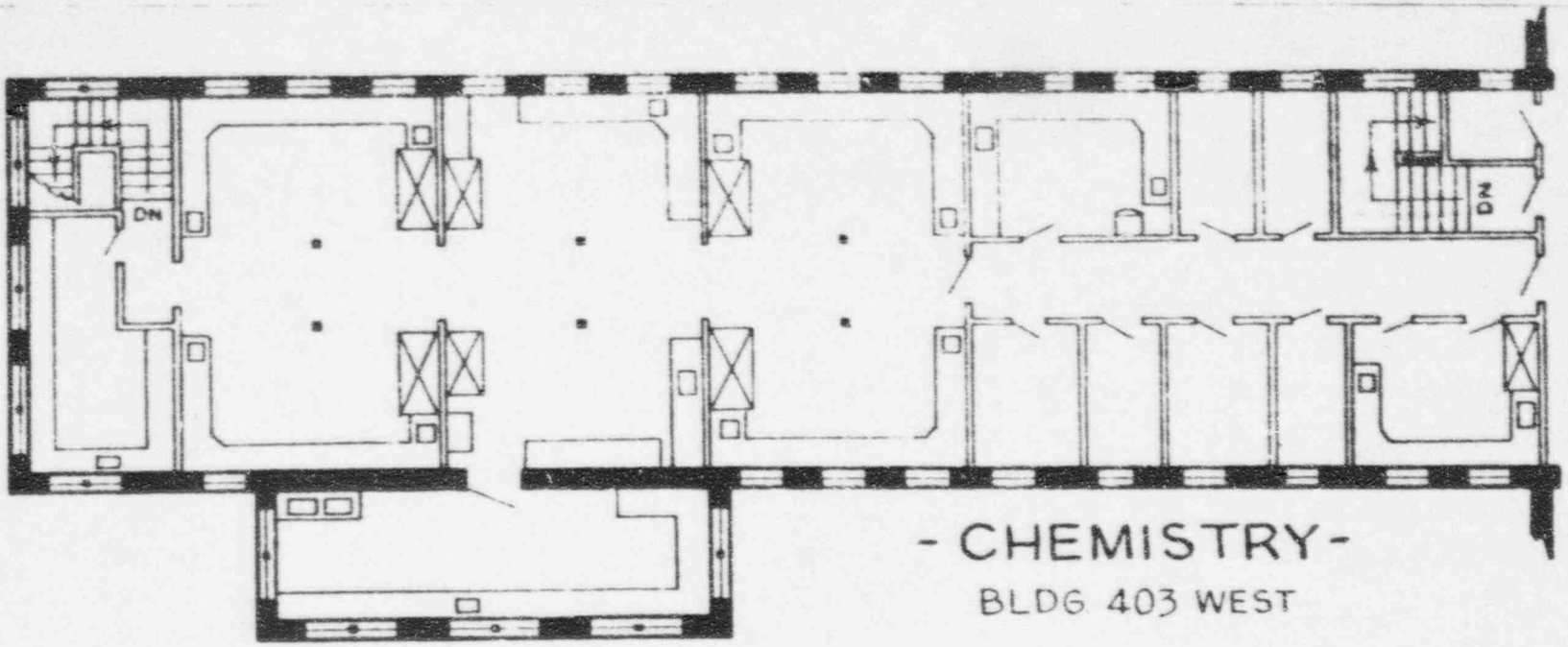
GROUP I ** No special handling required in normal laboratory procedures		GROUP II ** Not dangerous, but unnecessary exposure is to be avoided		GROUP III ** Dangerous, should be handled with utmost caution		
Isotope	Maximum Amount	Isotope	Maximum Amount	Isotope		Amount
Au^{189}	0.025mc	Au^{189}	1.000mc	Au^{189}	over	1.000mc
Br^{82}	0.300mc	Br^{82}	5.000mc	Br^{82}	"	5.000mc
Be^{7}	0.005mc	Be^{7}	0.100mc	Be^{7}	"	0.100mc
*C^{14} Urea	0.050mc	C^{14} Urea	1.000mc	C^{14} Urea	"	1.000mc
*C^{14} all other	0.025mc	C^{14} all other	1.000mc	C^{14} other	"	1.000mc
Ca^{45}	0.005mc	Ca^{45}	0.100mc	Ca^{45}	"	0.100mc
Co^{60}	0.025mc	Co^{60}	1.000mc	Co^{60}	"	1.000mc
Cr^{51}	0.025mc	Cr^{51}	1.000mc	Cr^{51}	"	1.000mc
Fe^{55}	0.005mc	Fe^{55}	0.100mc	Fe^{55}	"	0.100mc
Fe^{59}	0.025mc	Fe^{59}	1.000mc	Fe^{59}	"	1.000mc
*H^{3} Water	0.025mc	H^{3} Water	10.000mc	H^{3} Water	"	10.000mc
*H^{3} Thymidine	0.001mc	H^{3} Thymidine	0.050mc	H^{3} Thymidine	"	0.050mc
*H^{3} all other	0.005mc	H^{3} all other	0.100mc	H^{3} other	"	0.100mc
I^{131}	0.025mc	I^{131}	1.000mc	I^{131}	"	1.000mc
Na^{22}	0.025mc	Na^{22}	1.000mc	Na^{22}	"	1.000mc
P^{32}	0.025mc	P^{32}	1.000mc	P^{32}	"	1.000mc
S^{35}	0.025mc	S^{35}	1.000mc	S^{35}	"	1.000mc
Se^{75}	0.025mc	Se^{75}	1.000mc	Se^{75}	"	1.000mc
Sr^{85}	0.025mc	Sr^{85}	1.000mc	Sr^{85}	"	1.000mc
Sr^{89}	0.025mc	Sr^{89}	1.000mc	Sr^{89}	"	1.000mc
Sr^{90}	0.005mc	Sr^{90}	0.100mc	Sr^{90}	"	0.100mc
Zn^{65}	0.005mc	Zn^{65}	0.100mc	Zn^{65}	"	0.100mc

* Group classification dependent upon chemical form.

** It must be remembered that these limits are by no means fixed and that any undue exposure is undesirable. Therefore, when working with the above radioisotopes, the physical characteristics, half-life, the internal and external hazard, and the radiative properties of the radioactive material must be considered. If in doubt, always consult the Chief, Radioisotope Branch.

RADIOISOTOPE LABORATORY
USAMRNL
BLDG. 405





- CHEMISTRY -

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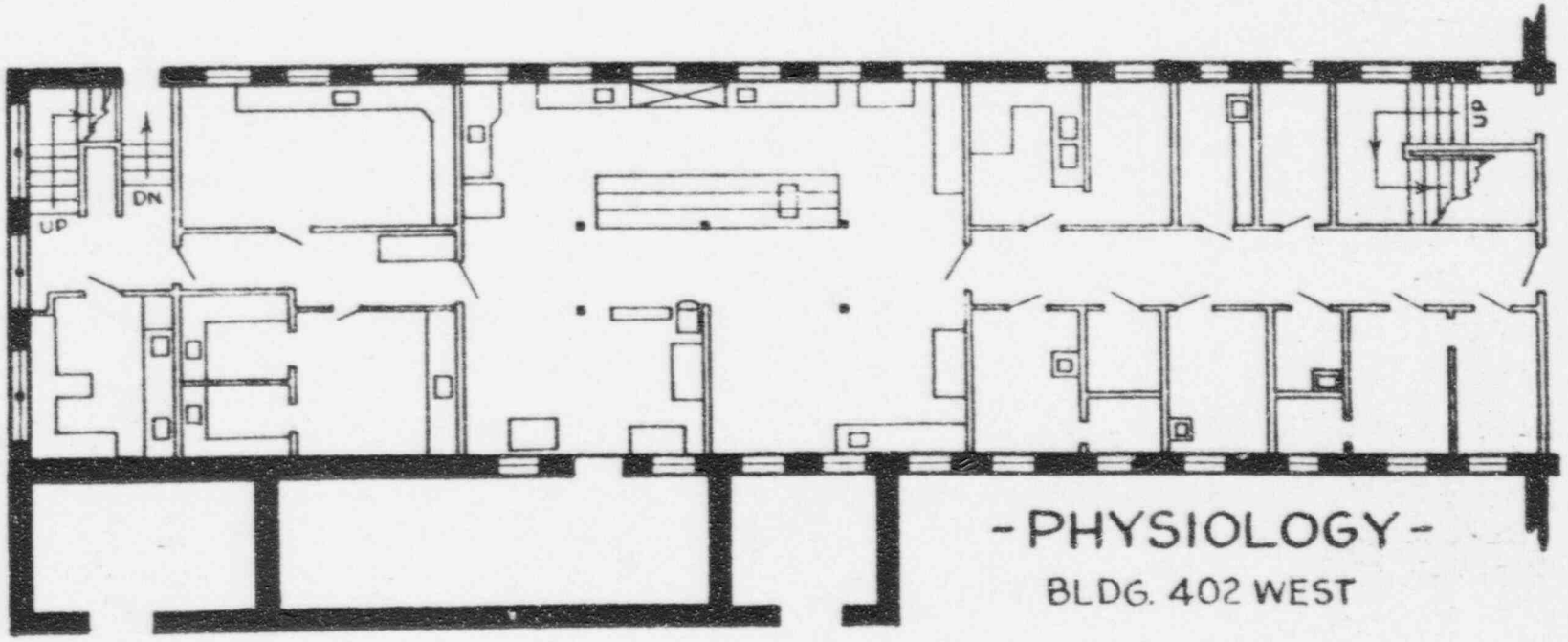

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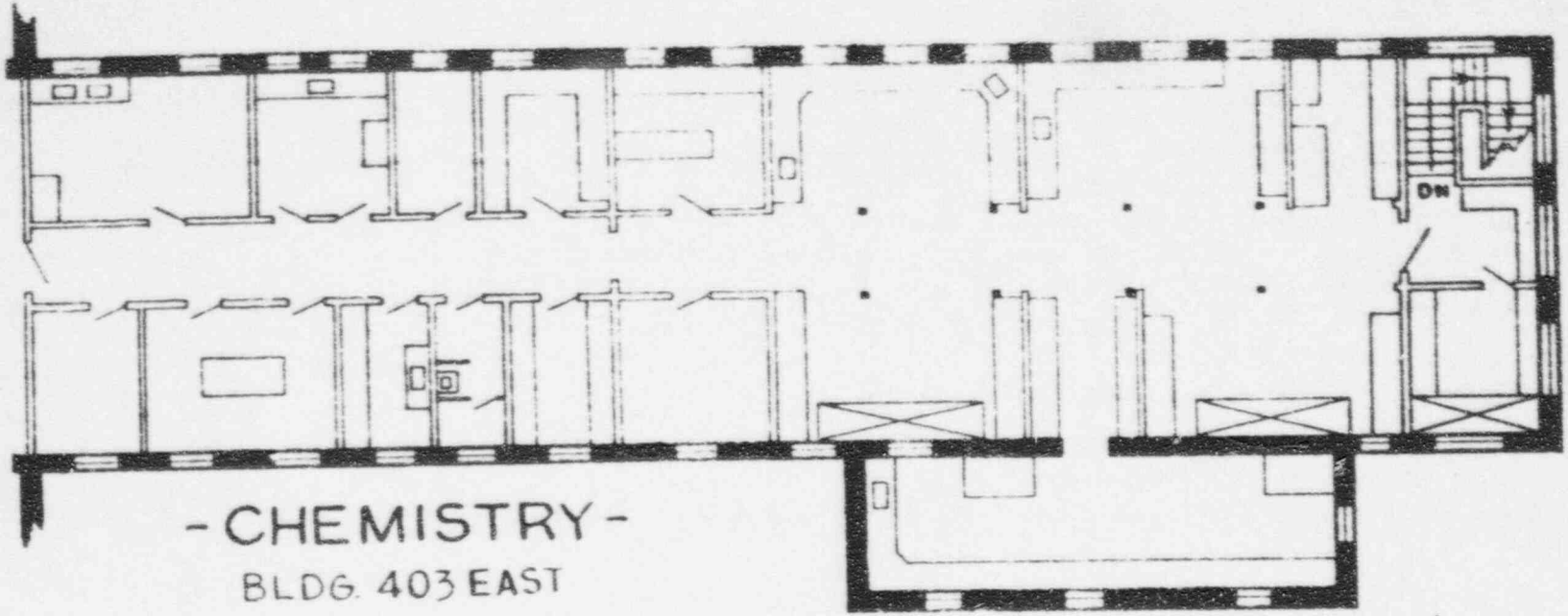
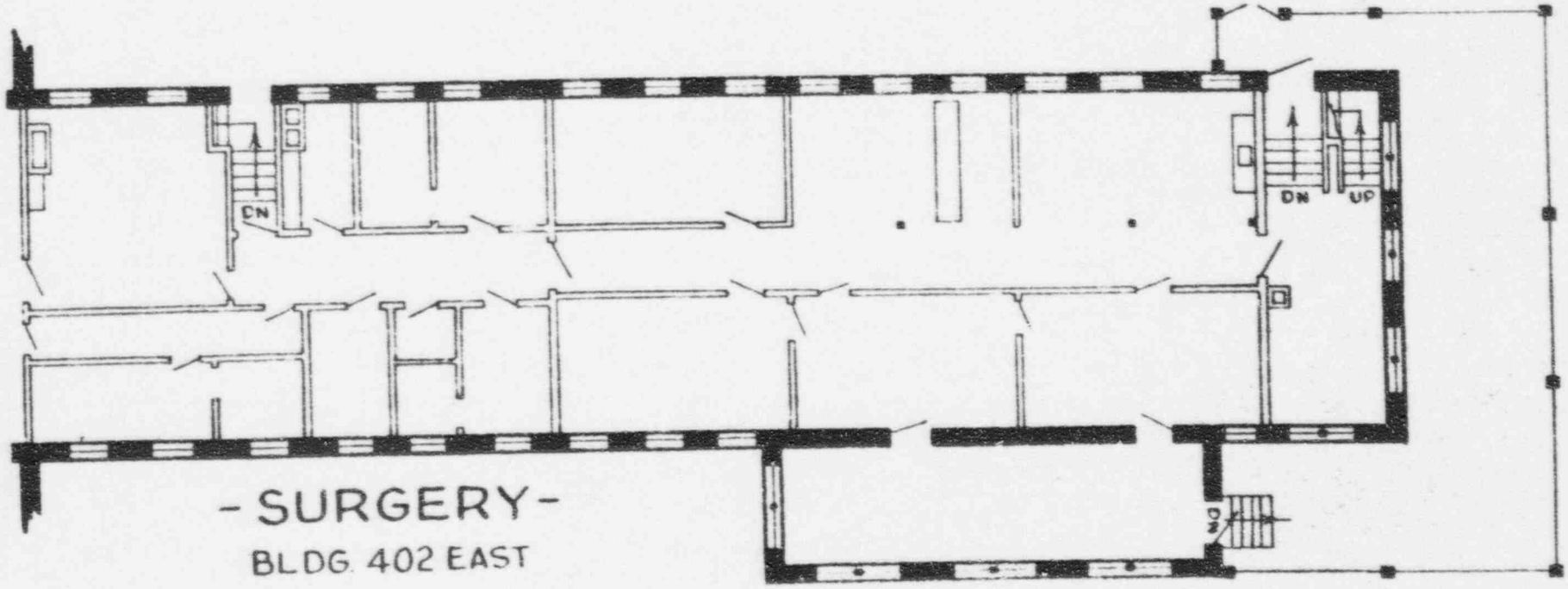


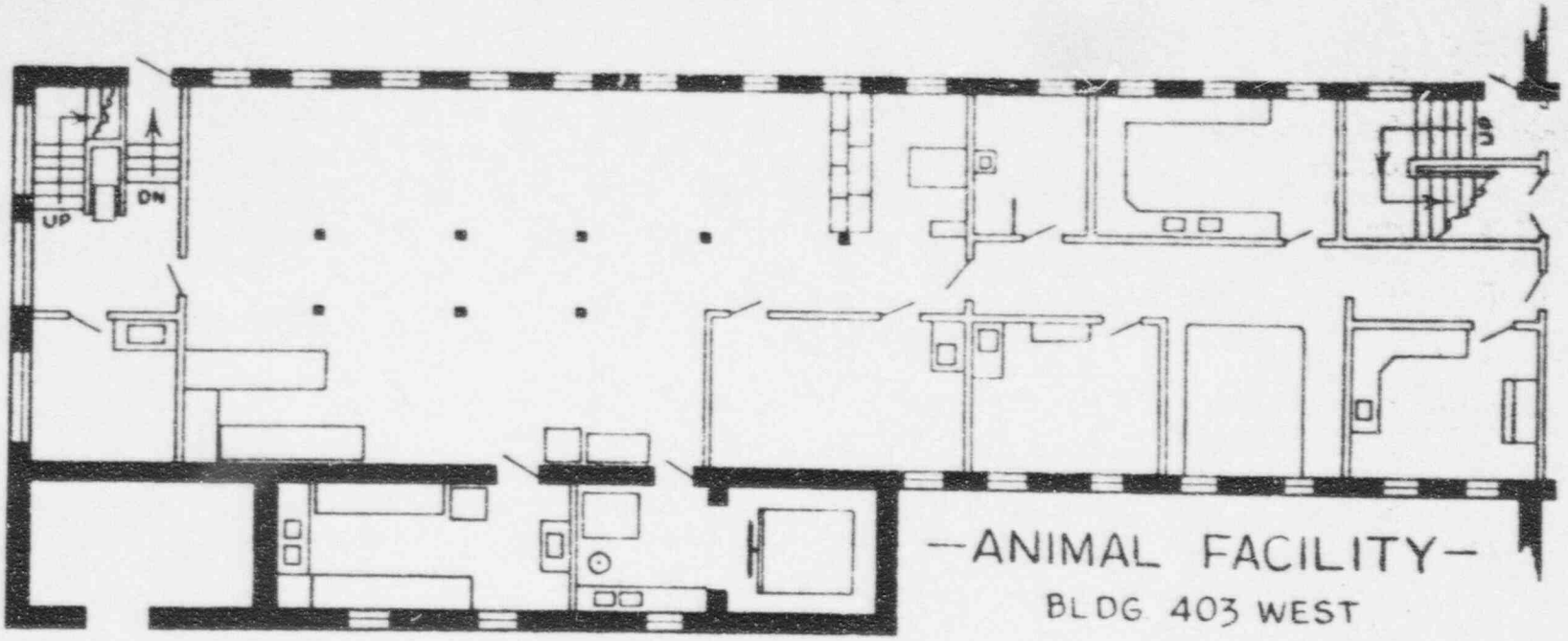
-CHEMISTRY-

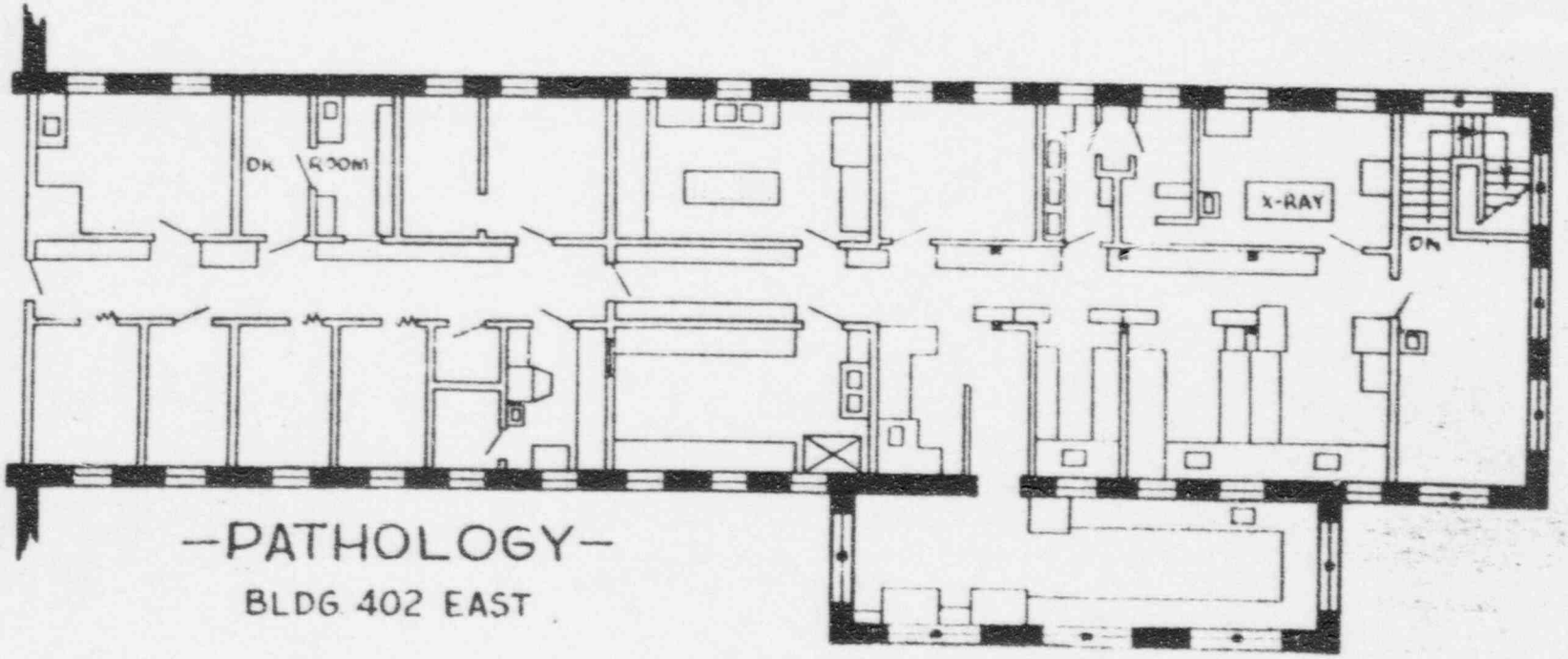
BLDG. 403 EAST



-SURGERY-

BLDG. 402 EAST


UP
DN
UP
-ANIMAL FACILITY-
BLDG 403 WEST


DARK ROOM
X-RAY
DN
-PATHOLOGY-
BLDG 402 EAST

Radioisotope Storage Areas in the U.S. Army Medical Research and Nutrition Laboratory Fitzsimons General Hospital

All radioisotope storage areas in USAMRNL are located in the radioisotope laboratory which is an area that has controlled access. The controlled area falls within the definition set forth in CFR, Title 10 Part 20, No. 14 and is "off limits" to all persons except those authorized by the Chief, Radioisotope Laboratory.

There are three storage areas in the radioisotope laboratory, USAMRNL.

1. These radioisotopes not requiring refrigeration are kept in a specially designed hood which completely surrounds all radioactive material with one inch of lead.

2. Gamma emitting isotopes requiring refrigeration are kept inside a refrigerator. Within the refrigerator all isotope containers are completely surrounded by a total of twelve lead bricks. Each brick has dimensions of 8"x4"x2".

3. Beta emitting isotopes are kept in a refrigerator other than the one named in "2" above. No lead shielding is required.

All storage areas are checked periodically. Radiation levels at the surface of the storage areas are never allowed to exceed one milliroentgen per hour.

Any deviations from these rules will be with the prior approval of the Radiological Safety Officers.

PROCEDURE FOR HANDLING RADIOACTIVE GASES, Xenon-133

Radioactive gases, Xenon-133, will be purchased from a commercial supplier as the highly purified gas sealed in a glass capsule with appropriate shielding.

The gas is diluted with carbon dioxide and transferred into a lead shielded mercury-displacement reservoir for dispensing in small amounts. This reservoir is kept in a hood with a blower-vent system.

When required the mercury reservoir is used to expel aliquots of gas into a glass syringe fitted with a tap. The amount of radioactive gas in the syringe is measured in a well scintillation detector. The appropriate amount of radioactive gas is administered in two ways: (1) Intravenously after being placed in solution with saline, or (2) by means of a closed-system metal spirometer. The patient expires into a closed system, thus trapping all the radioactive gas, which is transported by heavy-walled rubber or plastic tubing to the blower-vent system. At the completion of the study, the radioactive gas remaining in the spirometer system is displaced into the blower-vent system by means of room air pumped into the system. Xenon is adequately shielded by the metal spirometer.

The dosage of radioactive xenon to be administered to the patient is 500-1000 microcuries. The total radiation dosage to the lungs of a normal subject in the complete study is 40-60 mrads. The patient with severe pulmonary disease receives as much as 100 mrads.

The technique and methodology was developed by W. G.-Bull and B. V. Peters at McGill University, and G. T. Bellamy and P. Hugh-Jones at Queen Elizabeth Hospital, London.

RADIOISOTOPE SECTION
FITZSIMONS GENERAL HOSPITAL

ISOLATION PROCEDURE FOR RADIOACTIVE IODINE (I^{131}) THERAPY PATIENTS

1. Have patient in private room with private bath.

2. Entrance of isolation area must be well marked with appropriate signs indicating isolation hazard. ("Radiation Area" signs delineate 2 mr area).

3. Instruct visitors to keep a distance of 6 feet between themselves and the patient. Limit visits to 15 minutes.

4. Safe time for nursing care is approximately 5 hours total per person for the entire period of isolation.

5. Safe distance - no less than 25 inches between personnel and patient.

   Instruct personnel to do necessary work quickly and when possible to remain a distance from the patient. Best protection at the nursing level will be found in any additional distance than can be placed between nurse and patient. Personnel may be rotated to reduce exposure to the individual.

6. Vomitus within the first 12 hours is considered as radioactive contamination.

7. All linen used by the patient must be kept in the room until monitored and disposed of by personnel of the radioisotope section.

8. Urine is considered radioactive for the first 72 hours following therapy. All urine is to be saved by patient in a container provided and will be disposed of by the radioisotope section. No specimen is to be sent to the clinical laboratory during this period.

9. Blood will not be withdrawn for diagnostic purpose within 72 hours following therapy.

10. Dishes, glassware, books, radios, etc. can be removed from the room without monitoring.

11. Pregnant personnel should not give direct nursing care to the patient during the period of isolation.

12. In case of any unusual occurrence contact the Radioisotope Section (Ext. 22133).

RADIOISOTOPE SECTION
FITZSIMONS GENERAL HOSPITAL

ISOLATION PROCEDURE FOR RADIOGOLD (Au^{198}) PATIENTS

1. Have patient in private room with private bath.

2. Entrance of isolation area must be well marked with appropriate signs indicating radiation hazard. ("Radiation Area" signs delineate 2mr area).

3. Instruct visitors to keep a distance of 6 feet between themselves and the patient. Limit visits to 15 minutes.

4. Safe time for nursing care is approximately 5 hours total per person for entire time of isolations.

5. Safe distance - no less than 25 inches between personnel and patient.

   Instruct personnel to do necessary work quickly and when possible to remain a distance from the patient. Best protection at the nursing level will be found in any additional distance that can be placed between nurse and patient. Personnel may be rotated to reduce exposure to the individual.

6. Dishes, glassware, books, radios, etc. can be removed from the room without monitoring except where evidence of leakage has occurred in intracavitary therapy cases.

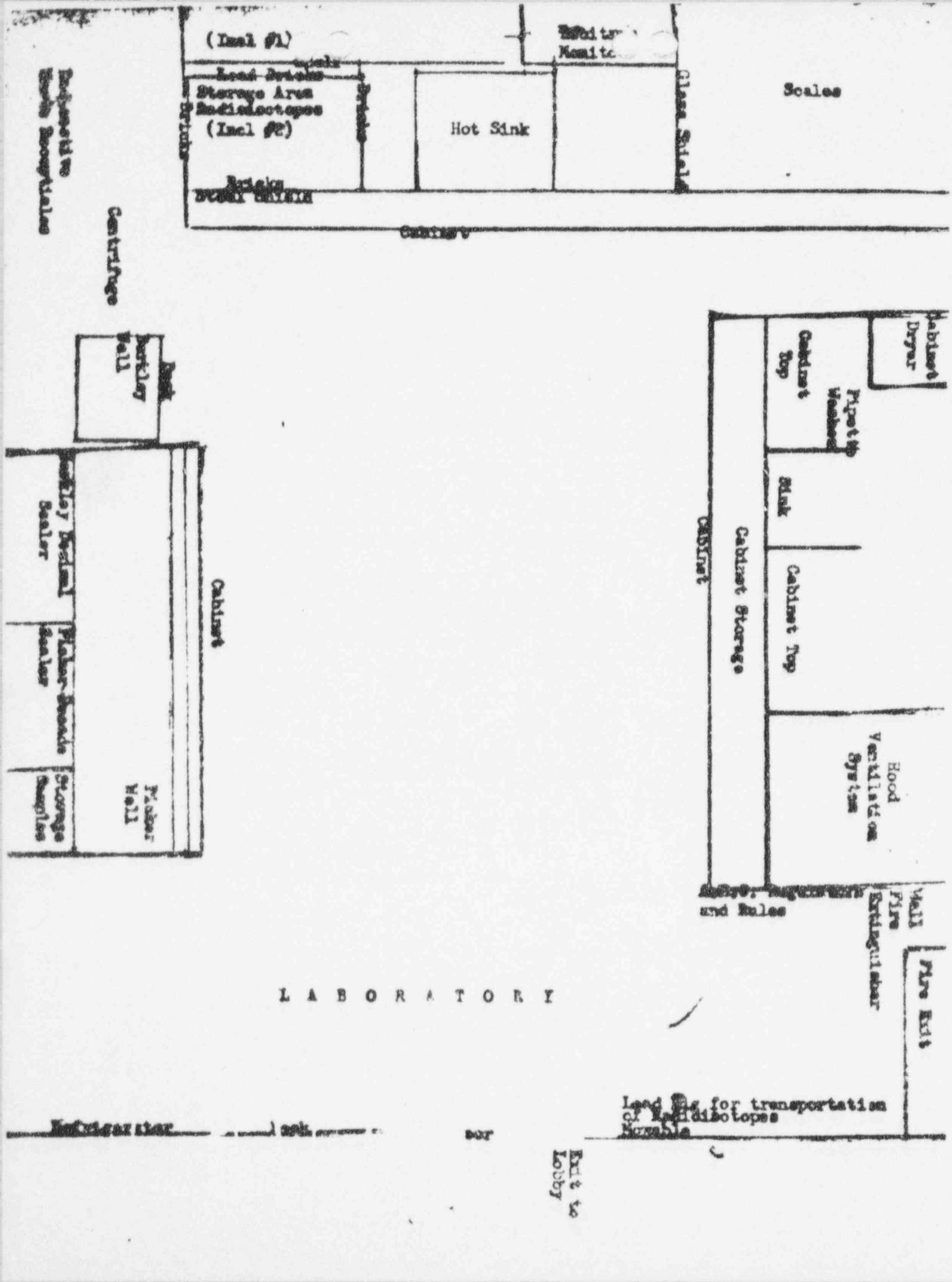
7. No precautions with excreta.

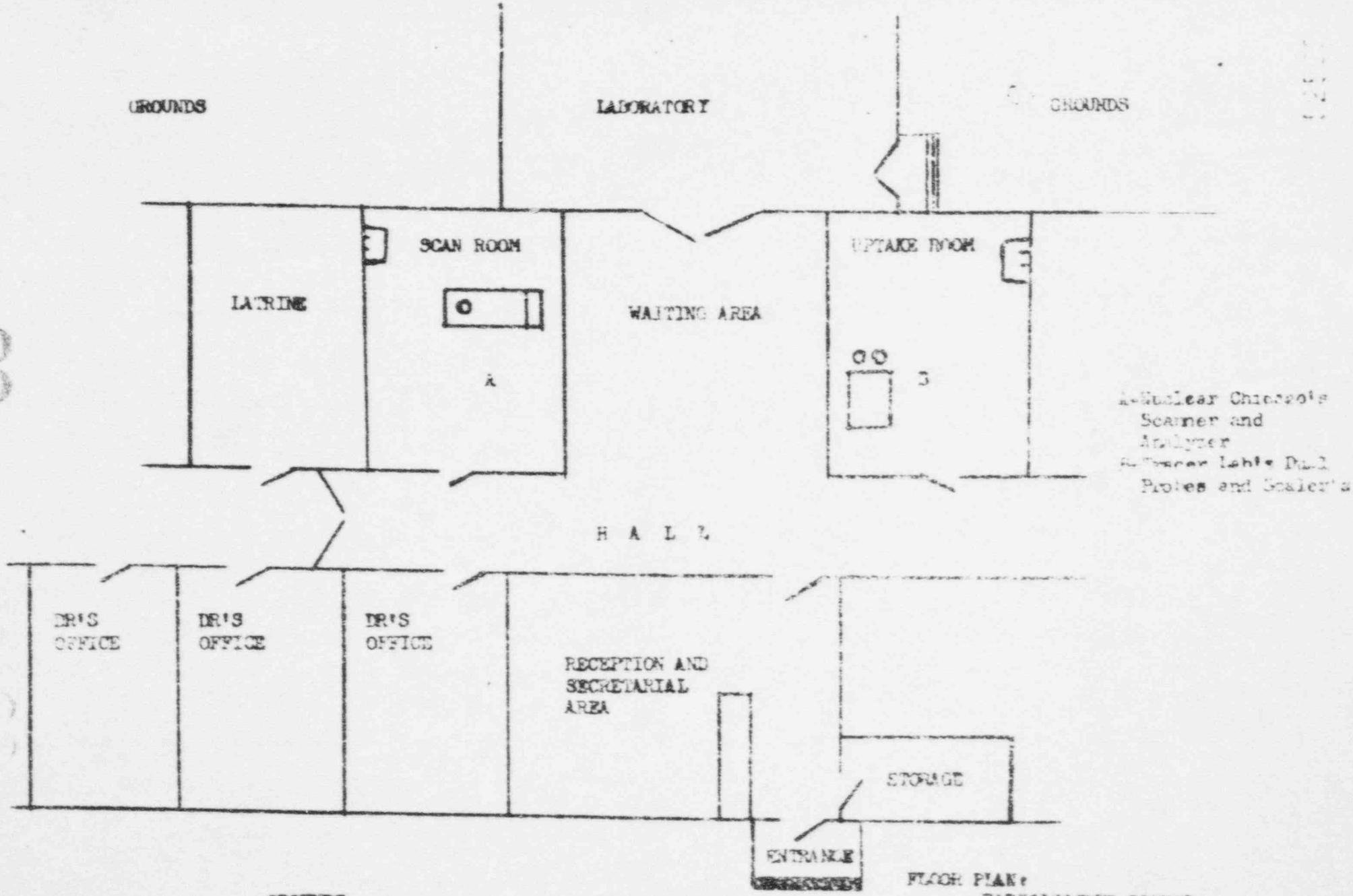
8. Any linen or dressings used by patient must be kept in the room until monitored and disposed of by personnel of the Radioisotope Section.

9. If any leakage occurs, notify the Radioisotope Section (Ext. 22133).

10. It is of utmost importance that patient be moved as instructed by physician.

11. Pregnant personnel should not give direct nursing care to the patient during period of isolation.


(Incl #1)
Hot Sink
Scales
Cabinet
Centrifuge
Cabinet Dryer
Cabinet Top
Sink
Cabinet Storage
Cabinet Top
Hood Ventilation System
Cabinet
Fire Extinguisher
Fire Exit
LABORATORY
Exit to Lobby



FLOOR PLAN:
RADIOISOTOPE CLINIC
FITZSIMONS GENERAL HOSPITAL
DENVER 40, COLORADO

EQUIPMENT FOR HANDLING RADIOISOTOPES

1. Remote pipetting device (Tracerlab)

2. Two (2) long handle tongs.
   Two (2) long handle mechanical finger tongs.
   Two (2) bottle cap removing devices. (Saf-turn-Abbott).

3. Gloves

DESCRIPTION OF RADIOISOTOPE STORAGE AREA

1. Radioisotopes are stored in a space 12 x 16 inches and 8 inches depth.

2. This area is completely surrounded with two thicknesses of lead bricks. The thickness measures a total of (4) inches.

3. Outside of this area there is a double thickness of steel shielding which surrounds three sides of the area.

4. A special lead well for storage of high activity isotopes is enclosed in this area.

5. All radioisotopes are stored in lead containers in designated areas of the enclosed storage area.