

<b>NRC FORM 313M</b> (9-81) 10 CFR 35	<b>U.S. NUCLEAR REGULATORY COMMISSION</b> <b>APPLICATION FOR MATERIALS LICENSE – MEDICAL</b>	Approved by OMB 3150-0041
---	---	------------------------------

**INSTRUCTIONS** – Complete Items 1 through 26 if this is an initial application or an application for renewal of a license. Use supplemental sheets where necessary. Item 26 must be completed on all applications and signed. Retain one copy. Submit original and one copy of entire application to: Director, Office of Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Upon approval of this application, the applicant will receive a Materials License. An NRC Materials 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, Parts 19, 20 and 35 and the license fee provision of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 26 and the appropriate fee enclosed.

<b>1.a. NAME AND MAILING ADDRESS OF APPLICANT</b> (institution, firm, clinic, physician, etc.) INCLUDE ZIP CODE  Mercy Hospital 1248 Kinneys Lane Portsmouth, Ohio 45662  TELEPHONE NO.: AREA CODE (614) <u>353</u> <u>2131</u>	<b>1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED</b> (If different from 1.a.) INCLUDE ZIP CODE  Same
<b>2. PERSON TO CONTACT REGARDING THIS APPLICATION</b>  George V. Johnson, M.D.  TELEPHONE NO.: AREA CODE (614) <u>353</u> <u>2131</u>	<b>3. THIS IS AN APPLICATION FOR:</b> (Check appropriate item) a. <input type="checkbox"/> NEW LICENSE b. <input type="checkbox"/> AMENDMENT TO LICENSE NO. _____ c. <input checked="" type="checkbox"/> RENEWAL OF LICENSE NO. <u>34-18776-01</u>
<b>4. INDIVIDUAL USERS</b> (Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)  George V. Johnson, M.D. William Buente, M.D. / Joseph Gohmann, M.D. Jerald Hansing, M.D. Charles Morris, M.D.	<b>5. RADIATION SAFETY OFFICER (RSO)</b> (Name of person designated as radiation safety officer. If other than individual user, complete resume of training and experience as in Supplement A.)  George V. Johnson, M.D.

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE			
RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)	ADDITIONAL ITEMS: <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;">MARK ITEMS DESIRED "X"</div> <div style="width: 35%;">MAXIMUM POSSESSION LIMITS (In millicuries)</div> </div>
10 CFR 31.11 FOR IN VITRO STUDIES	X		IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM <div style="display: flex; justify-content: space-between;"> <div style="width: 10%; text-align: center;">X</div> <div style="width: 35%;">as needed</div> </div>
10 CFR 35.100, SCHEDULE A, GROUP I	X	AS NEEDED	PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;"></div> <div style="width: 35%;"></div> </div>
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED	PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;"></div> <div style="width: 35%;"></div> </div>
10 CFR 35.100, SCHEDULE A, GROUP III	X	2000	GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS. <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;"></div> <div style="width: 35%;"></div> </div>
10 CFR 35.100, SCHEDULE A, GROUP IV	X	AS NEEDED	IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;"></div> <div style="width: 35%;"></div> </div>
10 CFR 35.100, SCHEDULE A, GROUP V	X	AS NEEDED	XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES. <div style="display: flex; justify-content: space-between;"> <div style="width: 10%;"></div> <div style="width: 35%;"></div> </div>
10 CFR 35.100, SCHEDULE A, GROUP VI			

6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a. (Sealed sources up to 3 mCi used for calibration and reference standards are authorized under Section 35.14(d), 10 CFR Part 35, and NEED NOT BE LISTED.)			
ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	MAXIMUM NUMBER OF MILLICURIES OF EACH FORM	DESCRIBE PURPOSE OF USE
<b>8506050464 850515</b> <b>REG3 LIC30</b> <b>34-18776-01 PDR</b>			<div style="border: 1px solid black; padding: 5px;">           Applicant: <u>May</u>            Check No. <u>06385</u>            Amount Fee Category <u>\$580</u>            Type of Fee <u>Ren</u>            Date Check Rec'd <u>5/1/85</u>            Received By <u>[Signature]</u> </div>

# **INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23**

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8 , Rev. 1 Date: October 1980

<b>7. MEDICAL ISOTOPES COMMITTEE</b>		<b>15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)</b>	
<input checked="" type="checkbox"/>	Names and Specialties Attached; and	<input checked="" type="checkbox"/>	Appendix G Rules Followed; or
<input checked="" type="checkbox"/>	Duties as in Appendix B; or (Check One)		Equivalent Rules Attached
	Equivalent Duties Attached	<b>16. EMERGENCY PROCEDURES (Check One)</b>	
<b>8. TRAINING AND EXPERIENCE</b>		<input checked="" type="checkbox"/>	Appendix H Procedures Followed; or
<input checked="" type="checkbox"/>	Supplements A & B Attached for Each Individual User; and		Equivalent Procedures Attached
<input checked="" type="checkbox"/>	Supplement A Attached for RSO.	<b>17. AREA SURVEY PROCEDURES (Check One)</b>	
<b>9. INSTRUMENTATION (Check One)</b>		<input checked="" type="checkbox"/>	Appendix I Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix C Form Attached; or		Equivalent Procedures Attached
	List by Name and Model Number	<b>18. WASTE DISPOSAL (Check One)</b>	
<b>10. CALIBRATION OF INSTRUMENTS</b>		<input checked="" type="checkbox"/>	Appendix J Form Attached; or
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Survey Instruments; or (Check One)		Equivalent Information Attached
	Equivalent Procedures Attached; and	<b>19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS (Check One)</b>	
<input checked="" type="checkbox"/>	Appendix D Procedures Followed for Dose Calibrator; or (Check One)		Appendix K Procedures Followed; or
	Equivalent Procedures Attached	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
<b>11. FACILITIES AND EQUIPMENT</b>		<b>20. THERAPEUTIC USE OF SEALED SOURCES</b>	
<input checked="" type="checkbox"/>	Description and Diagram Attached		Detailed Information Attached; and
<b>12. PERSONNEL TRAINING PROGRAM</b>			Appendix L Procedures Followed; or (Check One)
<input checked="" type="checkbox"/>	Description of Training Attached		Equivalent Procedures Attached
<b>13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL</b>		<b>21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon - 133)</b>	
<input checked="" type="checkbox"/>	Detailed Information Attached		Detailed Information Attached
<b>14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS (Check One)</b>		<b>22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS</b>	
<input checked="" type="checkbox"/>	Appendix F Procedures Followed; or		Detailed Information Attached
	Equivalent Procedures Attached	<b>23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b</b>	
			Detailed Information Attached

## 24. PERSONNEL MONITORING DEVICES

	TYPE <small>(Check appropriate box)</small>	SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	FILM	R.S. Landauer Company	monthly
	TLD		
	OTHER <i>(Specify)</i>		
b. FINGER	FILM		
	TLD	R.S. Landauer Company	monthly
	OTHER <i>(Specify)</i>		
c. WRIST	FILM		
	TLD		
	OTHER <i>(Specify)</i>		

d. OTHER *(Specify)*

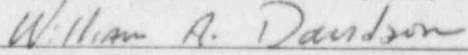
## 25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL			
NAME OF HOSPITAL		b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.	
MAILING ADDRESS		c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.	
CITY	STATE	ZIP CODE	

## 26. CERTIFICATE

*(This item must be completed by applicant)*

The applicant and any official executing this certificate on behalf of the applicant named in Item 1a certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Parts 30 and 35, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

a. LICENSE FEE REQUIRED <i>(See Section 170.31, 10 CFR 170)</i>	b. APPLICANT OR CERTIFYING OFFICIAL <i>(Signature)</i> 
(1) LICENSE FEE CATEGORY: 10CFR 170, Section 170.31, category 7C	(1) NAME <i>(Type of Print)</i> William A. Davidson
(2) LICENSE FEE ENCLOSED: \$ 580.00	(2) TITLE Assistant Administrator Professional Services
	c. DATE April 26, 1985

## PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313M. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S)** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30-36 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES** The information may be used: (a) to provide records to State health departments for their information and use; and (b) to provide information to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for a NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you. A copy of the license issued will routinely be placed in the NRC's Public Document Room, 1717 H Street, N.W., Washington, D.C.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed.
5. **SYSTEM MANAGER(S) AND ADDRESS** Director, Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

65 MAY -1 P211  
NRC BRANCH



7. Medical Isotopes Committee  
(Radiation Safety Committee)

The Medical Isotopes Committee includes the following members:

George V. Johnson, M.D.	Chairman, Radiologist
Charles Morris, M.D.	Radiologist
William Buente, M.D.	Radiologist
Jerald Hansing, M.D.	Radiologist
Joseph Cohnmann, M.D.	Pathologist
Miller Toombs, M.D.	Family Practice, Chief of Medical Staff
James Kereiakes, Ph.D.	Radiologic Physicist
William Davidson	Assistant Administrator
Don Evans, R.T.	Department Head, Diagnostic Imaging
Patricia Bracknell, CNMT	Supervisor, Nuclear Medicine
Jean Carlson, R.N.	Nursing Service Representative
Joyce Kilgore, R.N.	Quality Assurance Coordinator
Delsie Horne, M.T.	Department Head, Laboratory

#### 8. Training and Experience

George V. Johnson, M.D.	previously authorized	license #34-18776-01
William Buente, M.D.	previously authorized	license #34-18776-01
Jerald Hansing, M.D.	previously authorized	license #34-18776-01
Charles Morris, M.D.	previously authorized	license #34-18776-01

Supplements A and B also attached.

TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

*George V. Johnson, M.D.*2. STATE OR TERRITORY IN  
WHICH LICENSED TO  
PRACTICE MEDICINE*Ohio*

## 3. CERTIFICATION

SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C
<i>RADIOLOGY</i>	<i>General Radiology (Diagnostic Radiology Therapeutic Radiology And Nuclear Medicine)</i>	<i>JUNE 1974</i>

## 4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	<i>Ohio State University Hospital Columbus Ohio Apr 67 to Mar 70</i>	<i>50</i>	<i>50</i>
b. RADIATION PROTECTION	<i>.....</i>	<i>30</i>	<i>30</i>
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	<i>.....</i>	<i>20</i>	<i>20</i>
d. RADIATION BIOLOGY	<i>.....</i>	<i>20</i>	<i>20</i>
e. RADIOPHARMACEUTICAL CHEMISTRY	<i>.....</i>	<i>30</i>	<i>30</i>

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
<i>Co 60</i>	<i>3300 Curies</i>	<i>Georgetown Hosp Portsmouth Ohio</i>	<i>1974 to present</i>	<i>Radiation Therapy</i>
<i>Radium</i>	<i>150 millicuries</i>	<i>.....</i>	<i>1972 to present</i>	<i>Radiation intracavitary therapy radiation</i>
<i>Tc 99m</i>	<i>500 millicuries (generator) Diagnostic amount</i>	<i>.....</i>	<i>1972 to present</i>	<i>Diagnostic Nuclear Imaging</i>

I-131

10 millicuries

SMH

1972 to present

Hyperthyroidism  
therapy

---

Please refer to preceptor statement for additional radioisotope experience



(9-78)

# TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

Gerald D. Hansing, M.D.

2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE

Ohio; Connecticut

## 3. CERTIFICATION

SPECIALTY BOARD  
ACATEGORY  
BMONTH AND YEAR CERTIFIED  
C

## 4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

## TYPE AND LENGTH OF TRAINING

FIELD OF TRAINING  
ALOCATION AND DATE(S) OF TRAINING  
BLECTURE/  
LABORATORY  
COURSES  
(Hours)  
CSUPERVISED  
LABORATORY  
EXPERIENCE  
(Hours)  
D

a. RADIATION PHYSICS AND INSTRUMENTATION

Yale - New Haven Hosp.  
New Haven, Ct.  
7/79 → 6/82

100

100

b. RADIATION PROTECTION

25

25

c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY

25

25

d. RADIATION BIOLOGY

25

25

e. RADIOPHARMACEUTICAL CHEMISTRY

25

25

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc-99m	20 mCi	Yale - New Haven Hospital	7/79 to 6/82	Diagnostic Radiology with selectal Therapy cases.
Xe-133	15 mCi			
I-123	100 mCi			
I-131	50 mCi			
Ga-67	10 mCi			
Fa-111	500 mCi			
Ci-51	50 mCi			

## PRECEPTOR STATEMENT

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

## 1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

HANSING, JERALD D., M.D.

STREET ADDRESS

New Haven,

Conn. 06511

CITY

STATE

ZIP CODE

## KEY TO COLUMN C

## PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for radionuclide diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED A B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	29	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME	2	
	LIVER FUNCTION STUDIES	0	
	FAT ABSORPTION STUDIES	0	
	KIDNEY FUNCTION STUDIES	0	
	IN VITRO STUDIES	0	
OTHER			
I-125	DETECTION OF THROMBOSIS	0	
I-131	THYROID IMAGING	0	
P-32	EYE TUMOR LOCALIZATION	1	
Sr-75	PANCREAS IMAGING	0	
Yb-169	OSTERNOGRAPHY	0	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	71	
OTHER	Thallium-201 Cardiac	42	
Tc-99m	BRAIN IMAGING	21	
	CARDIAC IMAGING	239	
	THYROID IMAGING	53	
	SALIVARY GLAND IMAGING	2	
	BLOOD POOL IMAGING	63	
	PLACENTA LOCALIZATION	0	
	LIVER AND SPLEEN IMAGING	231	
	LUNG IMAGING	71	
	BONE IMAGING	235	
OTHER	Renal imaging	35	

# PRECEPTOR STATEMENT (Continued)

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Sodium)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES	0	
P-32 (Colloid)	INTRACAVITARY TREATMENT	0	
I-131	TREATMENT OF THYROID CARCINOMA	3	
	TREATMENT OF HYPERTHYROIDISM	3	
Au-198	INTRACAVITARY TREATMENT	0	
Co-60 or Cs-137	INTERSTITIAL TREATMENT	0	
Co-60 or Cs-137	INTRACAVITARY TREATMENT	0	
	INTERSTITIAL TREATMENT	0	
Co-60 or Cs-137	TELETHERAPY TREATMENT	0	
Si-90	TREATMENT OF EYE DISEASE	0	
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	50	
Sr-90/ Y-90	GENERATOR	0	
Tc-99m	REAGENT KITS	50	
Other			

Gallium-67 Tumor/Abscess Imaging 120  
Disofenin Hepatobiliary Imaging 54

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

(A) Sept. - Oct. @ 50 hrs/week 450 hr's  
(B) Conferences (1979-82) 130 hr's  
(C) Physics Course (1981) 20  
Total 600 hr's.

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

a. NAME OF SUPERVISOR

Paul B. Hoffer, M.D.

b. NAME OF INSTITUTION

Yale University School of Medicine

c. MAILING ADDRESS

Dept. of Diag. Rad. 333 Cedar Street

d. CITY

New Haven, CT 06510

## 5. MATERIALS LICENSE NUMBER(S):

06-00819-03

## 6. PRECEPTOR'S SIGNATURE

*Paul B. Hoffer*

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

Paul B. Hoffer, M.D.

## 8. DATE

5/14/82

TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER  Charles H. Morris, M.D.			2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE	
3. CERTIFICATION				
SPECIALTY BOARD A		CATEGORY B	MONTH AND YEAR CERTIFIED C	
American Board of Radiology		Radiology	June 1974	
4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES				
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING		
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D	
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Arkansas Medical Center (7/1/71-12/31/72) Charity Hospital of Louisiana	50	100	
b. RADIATION PROTECTION	(1/1/73-6/30/74) same	20	20	
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	same	20	----	
d. RADIATION BIOLOGY	same	30	----	
e. RADIOPHARMACEUTICAL CHEMISTRY	same	30	30	
5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc-99m	450 millicuries	Scioto Memorial Hosp. and Mercy Hospital Nuclear Medicine Laboratories	February 1980 to present	Milking generator to use in imaging & preparation with kits for imaging bone, brain, liver, spleen, heart & blood pool lung and thyroid organs.
I-131	12 millicuries	same as above	same as above	

I-131 Larger doses for hyperthyroidism treatment. Microcurie doses for thyroid uptake and imaging.



## PRECEPTOR STATEMENT

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

## 1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

Charles H. Morris

STREET ADDRESS

1248 Kinneys Lane

CITY

Portsmouth,

STATE

OH

ZIP CODE

45662

## KEY TO COLUMN C

## PERSONAL PARTICIPATION SHOULD CONSIST OF:

- 1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.
- 2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.
- 3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	50	These total numbers include experience at Scioto Memorial Hospital, Portsmouth, Ohio NRC License 34-15938-01 and Mercy Hospital, Portsmouth, Ohio NRC License 34-18776-01
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES	25	
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING	50	
P-32	EYE TUMOR LOCALIZATION		
Sr-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING	500	
	CARDIAC IMAGING	5	
	THYROID IMAGING	10	
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING	5	
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING	200	
	LUNG IMAGING	175	
	BONE IMAGING	250	
OTHER			

**PRECEPTOR STATEMENT (Continued)**

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		These total numbers include experience at Scioto Memorial Hospital, Portsmouth, Ohio NRC License 34-15938-01 and Mercy Hospital, Portsmouth Ohio NRC License 34-18776-01
P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM	3	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192 Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	6	
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS	6	
Other			

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

February 1980 to present  
1000 hrs.

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

a. NAME OF SUPERVISOR

George V. Johnson M.D.

b. NAME OF INSTITUTION

Mercy Hospital

c. MAILING ADDRESS

1248 Kinneys Lane

d. CITY

Portsmouth, Ohio 45662

5. MATERIALS LICENSE NUMBER(S)

34-18776-01

**6. PRECEPTOR'S SIGNATURE**

*George V. Johnson M.D.*

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

George V. Johnson, M.D.

8. DATE

11 Jan 82

**APPENDIX C**  
**INSTRUMENTATION**

**1. Survey meters**

- a. Manufacturer's name: Victoreen  
 Manufacturer's model number: 493  
 Number of instruments available: 1  
 Minimum range: 0.01 mR/hr to 0.5 mR/hr  
 Maximum range: 1 mR/hr to 50 mR/hr
- b. Manufacturer's name: Victoreen  
 Manufacturer's model number: 740-F  
 Number of instruments available: 1  
 Minimum range: 0.5 mR/hr to 25 mR/hr  
 Maximum range: 500 mR/hr to 25,000 mR/hr

**2. Dose calibrator**

Manufacturer's name: Capintec  
 Manufacturer's model number: CRC 17U  
 Number of instruments available: 1

**3. Instruments used for diagnostic procedures**

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	General Electric (Maxi-Cam II)	46-400321G1
Gamma Camera	Pickering International (DynaMo)	615291-1
Scintillation Well Counter for in-vitro studies	Abbott Laboratories	101B

4. Other (e.g., liquid scintillation counter, area monitor, velocimeter)

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

This page is to be completed by the applicant physician's preceptor. If more than one preceptor is necessary to document experience, enter a separate statement from each. Page 2 may be used for comments and additional information.

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

George V. Johnson, M.D.  
3340 Indian Drive, Portsmouth, Ohio, 45662 (Residence)

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

(A) ISOTOPE	(B) CONDITIONS DIAGNOSED OR TREATED	(C) No. Cases Observed (See 1 in key below)	(D) No. Cases Involving Personal Participation (See 2 in key below)
I-131 or I-125	Diagnosis of thyroid function	100	25
	Determination of blood and blood plasma volume	40	10
	Liver function studies	10	5
	Fat absorption studies	10	3
	Kidney function studies	10	15
	In vitro studies	100	25
Cr-51	Gastrointestinal protein loss studies	10	5
	Determination of red blood cell volume and studies of red blood cell survival	10	5
Fe-59	Iron turn over studies	10	5
Co-58 or Co-60	Intestinal absorption studies Co-57 (only)	10	5
K-42	Potassium space determinations		
I-131	Thyroid imaging	100	25
	Brain tumor localization and cardiac imaging		
	Cisternography	40	5
	Lung imaging	100	25
	Liver imaging	35	25
	Kidney imaging	50	10
	Placenta localization	2	1
Cr-51	Placenta localization		
	Spleen imaging		
Au-198	Liver imaging	2	2
Hg-197	Brain imaging		
	Kidney imaging	5	3
Hg-203	Brain imaging		
Sr-85	Bone imaging Sr-87m	40	10
Tc-99m	Brain imaging	200	50
	Thyroid imaging	10	3
	Salivary gland imaging	3	3
	Blood pool imaging	40	10



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

(II) CONDITIONS DIAGNOSED OR TREATED		(C) No. Cases Observed (See 1 in key below)	(D) No. Cases Involving Personal Participation (See 2 in key below)
Placenta localization		40	10
	Liver and spleen imaging	200	50
	Lung imaging (inhalation and perfusion)	200	50
	Bone imaging	100	50
Xe-133	Blood flow studies and pulmonary function studies		
Se-75	Pancreas imaging	25	5
P-32	Treatment of polycythemia, leukemia, and Bone metastases		
	Intracavitary treatment		
I-131	Treatment of thyroid carcinoma		
	Treatment of hyperthyroidism and cardiac condition	20	10
Au-198	Intracavitary treatment		
Co-60 or Cs-137	Interstitial treatment (Radon)	5	3
	Intracavitary treatment	20	10
Ir-192	Interstitial treatment		
Co-60 Cs-137	Teletherapy treatment	300	100
Sr-90	Treatment of eye disease	5	3

**Key to Column (C) and (D) above**

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

12. DATES AND TOTAL NUMBER OF HOURS OF CLINICAL RADIOISOTOPE TRAINING 1/1/70 to 3/30/70 (500 hours)

13. THE TRAINING AND EXPERIENCE INDICATED ABOVE WAS OBTAINED UNDER THE SUPERVISION OF X-2. Riccobono, M.D.  
Dr. Riccobono, M.D. is not at this institution anymore. Our records indicate that Dr. George V. Johnson received training in Nuclear Medicine as shown in this application in this department. The listed experience is accordance with our clinical work and the training program.

Atis K. Freimanis, M.D.  
Chairman & Professor  
Department of Radiology

The Ohio State University  
Columbus, Ohio 43210

AT \_\_\_\_\_  
(Institution Name and Address)

34-00293-02

\_\_\_\_\_  
(Byproduct Material License Number)

Atis K. Freimanis, M.D.  
(Signature of Preceptor)

Addendum to Form AEC-313a, Supplement A  
(C.V. Johnson, M.D.)

<u>A</u> Isotope	<u>B</u> Conditions Diagnosed or Treated	<u>C</u>	<u>D</u>
Au-198	Lymphangiogram	10	5
Sc-75	Parathyroid Imaging	2	1
	Tumor Imaging	10	3
I-123	Thyroid Imaging and Uptake	15	5
In-113M	Placenta Localization	5	3
	Myocardial Image	10	5
	Blood Pool Imaging	10	5
In-111	Bone Marrow Imaging	5	3
	Tumor Imaging	5	3
Ga-67	Tumor Imaging	5	3

The topics listed in Form AEC-313, item 8 were inclusive within the radiology residence training undertaken during July 1, 1967 to June 30, 1970.

TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

William L. Buente, M.D.

2. STATE OR TERRITORY IN  
WHICH LICENSED TO  
PRACTICE MEDICINE

Ohio

## 3. CERTIFICATION

SPECIALTY BOARD

A

CATEGORY

B

MONTH AND YEAR CERTIFIED

C

American Board of Radiology

Diagnostic Radiology

June, 1980

## 4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE, LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Cincinnati Radioisotope Lab. <i>State</i> ✓	100	
b. RADIATION PROTECTION	Same	30	
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Same	20	
d. RADIATION BIOLOGY	Same	20	
e. RADIOPHARMACEUTICAL CHEMISTRY	Same	30	

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc-99m	1.15 curie per elution approximately	Univ. of Cinti	500 hrs. <del>200</del>	generator elution; kit preparations more than 20 including: Tc-MAA Tc-sulfur colloid Tc-MDP Tc-DTPA Tc-glucoheptonate

## PRECEPTOR STATEMENT

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

## 1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

WILLIAM L. BUENTE

STREET ADDRESS

Box 199 Rt. 5

CITY

Portsmouth

STATE

Ohio

ZIP CODE

45662

## KEY TO COLUMN C

## PERSONAL PARTICIPATION SHOULD CONSIST OF:

- 1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage.
- 2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.
- 3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAME PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	100	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES	1	
	FAT ABSORPTION STUDIES	2	
	KIDNEY FUNCTION STUDIES	10	
	IN VITRO STUDIES	5	
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING	100	
P-32	EYE TUMOR LOCALIZATION		
Se-75	PANCREAS IMAGING	5	
Yb-169	CISTERNOGRAPHY	1	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	10	
OTHER			
Tc-99m	BRAIN IMAGING	150	
	CARDIAC IMAGING		
	THYROID IMAGING	10	
	SALIVARY GLAND IMAGING	5	
	BLOOD POOL IMAGING	25	
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING	75	
	LUNG IMAGING	75	
	BONE IMAGING	25	
OTHER			



# PRECEPTOR STATEMENT (Continued)

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		
P-32 (Colloidal)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA	10	
	TREATMENT OF HYPERTHYROIDISM		
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION	15	
Mo-99/ Tc-99m	GENERATOR		
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS	18	
Other			

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

DATES: July - September, 1977

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

a. NAME OF SUPERVISOR

Eugene L. Saenger, M.D.

b. NAME OF INSTITUTION

Univ. of Cincinnati Col. of Med.

c. MAILING ADDRESS

Radioisotope Lab-Cinti. Gen. Hosp.

d. CITY

Cincinnati, Ohio 45267

e. MATERIALS LICENSE NUMBER(S)

34-6903-05

## 5. PRECEPTOR'S SIGNATURE

Eugene L. Saenger, M.D.

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

Eugene L. Saenger, M.D.

8. DATE

August 7, 1979

(B-79)

# TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

Jerald D. Hansing, M.D.

2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE

Ohio; Connecticut

## 3. CERTIFICATION

SPECIALTY BOARD

A

CATEGORY

B

MONTH AND YEAR CERTIFIED

C

## 4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING	
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D
a. RADIATION PHYSICS AND INSTRUMENTATION	Yale - New Haven Hosp. New Haven, Ct. 7/79 to 6/82	100	100
b. RADIATION PROTECTION		25	25
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY		25	25
d. RADIATION BIOLOGY		25	25
e. RADIOPHARMACEUTICAL CHEMISTRY		25	25

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc-99m	20 mCi	Yale - New Haven Hospital	7/79 to 6/82	Diagnostic Radiology with selectal Therapy cases.
Xe-133	15 mCi			
I-123	100 mCi			
I-131	50 mCi			
Ga-67	10 mCi			
Fa-111	500 mCi			
Cr-51	50 mCi			

## PRECEPTOR STATEMENT

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

## 1. APPLICANT PHYSICIAN'S NAME AND ADDRESS

FULL NAME

HANSING, JERALD D., M.D.

STREET ADDRESS

New Haven, Conn. 06511

CITY

STATE

ZIP CODE

## KEY TO COLUMN C

## PERSONAL PARTICIPATION SHOULD CONSIST OF:

1-Supervised examination of patients to determine the suitability for rad-isotope diagnosis and/or treatment and recommendation for prescribed dosage.

2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data.

3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED A B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	29	
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME	2	
	LIVER FUNCTION STUDIES	0	
	FAT ABSORPTION STUDIES	0	
	KIDNEY FUNCTION STUDIES	0	
	IN VITRO STUDIES	0	
OTHER			
I-125	DETECTION OF THROMBOSIS	0	
I-131	THYROID IMAGING	0	
P-32	EYE TUMOR LOCALIZATION	1	
Sr-90	PANCREAS IMAGING	0	
Yb-169	OSTEONOGRAPHY	0	
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	71	
OTHER	Thallium-201 Cardiac	42	
Tc-99m	BRAIN IMAGING	21	
	CARDIAC IMAGING	239	
	THYROID IMAGING	53	
	SALIVARY GLAND IMAGING	2	
	BLOOD POOL IMAGING	63	
	PLACENTA LOCALIZATION	0	
	LIVER AND SPLEEN IMAGING	231	
	LUNG IMAGING	71	
	BONE IMAGING	235	
OTHER	Renal imaging	35	

# PRECEPTOR STATEMENT (Continued)

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Strontium)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES	0	
P-32 (Colloid)	INTRACAVITARY TREATMENT	0	
I-131	TREATMENT OF THYROID CARCINOMA	3	
	TREATMENT OF HYPERTHYROIDISM	3	
Au-198	INTRACAVITARY TREATMENT	0	
Co-60 or Cs-137	INTERSTITIAL TREATMENT	0	
	INTRACAVITARY TREATMENT	0	
I-125 or Ir-192	INTERSTITIAL TREATMENT	0	
Co-60 or Cs-137	TELETHERAPY TREATMENT	0	
Sr-90	TREATMENT OF EYE DISEASE	0	
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	50	
Sn-113/ In-113m	GENERATOR	0	
Tc-99m	REAGENT KITS	50	
Other			
Gallium-67	Tumor/Abscess Imaging	120	
Disofenin	Hepatobiliary Imaging	54	

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

(A) Sept. - Oct. @ 50 hr's/week 450 hr's

(B) Conferences (1979-82) 130 hr's

(C) Physics Course (1981) 20

Total 600 hr's.

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

A. NAME OF SUPERVISOR

Paul B. Hoffer, M.D.

B. NAME OF INSTITUTION

Yale University School of Medicine

C. MAILING ADDRESS

Dept. of Diag. Rad. 333 Cedar Street

D. CITY

New Haven, CT 06510

5. MATERIALS LICENSE NUMBER(S)

06-00819-03

6. PRECEPTOR'S SIGNATURE

*Paul B. Hoffer*

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

Paul B. Hoffer, M.D.

8. DATE

5/14/82



TRAINING AND EXPERIENCE  
AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER Charles H. Morris, M.D.		2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE		
3. CERTIFICATION				
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C		
American Board of Radiology	Radiology	June 1974		
4. TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES				
FIELD OF TRAINING A	LOCATION AND DATE(S) OF TRAINING B	TYPE AND LENGTH OF TRAINING		
		LECTURE/ LABORATORY COURSES (Hours) C	SUPERVISED LABORATORY EXPERIENCE (Hours) D	
a. RADIATION PHYSICS AND INSTRUMENTATION	University of Arkansas Medical Center (7/1/71-12/31/72) Charity Hospital of Louisiana	50	100	
b. RADIATION PROTECTION	(1/1/73-6/30/74) same	20	20	
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	same	20	----	
d. RADIATION BIOLOGY	same	30	----	
e. RADIOPHARMACEUTICAL CHEMISTRY	same	30	30	
5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Tc-99m	450 millicuries	Scioto Memorial Hosp. and Mercy Hospital Nuclear Medicine Laboratories	February 1980 to present	Milking generator to use in imaging & preparation with kits for imaging bone, brain, liver, spleen, heart & blood pool lung and thyroid organs.
I-131	12 millicuries	same as above	same as above	

I-131 Larger doses for hyperthyroidism treatment. Microcurie doses for thyroid uptake and imaging.

## PRECEPTOR STATEMENT

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

1. APPLICANT PHYSICIAN'S NAME AND ADDRESS		<b>KEY TO COLUMN C</b> <b>PERSONAL PARTICIPATION SHOULD CONSIST OF:</b> 1-Supervised examination of patients to determine the suitability for radioisotope diagnosis and/or treatment and recommendation for prescribed dosage. 2-Collaboration in dose calibration and actual administration of dose to the patient including calculation of the radiation dose, related measurements and plotting of data. 3-Adequate period of training to enable physician to manage radioactive patients and follow patients through diagnosis and/or course of treatment.	
FULL NAME			
Charles H. Morris			
STREET ADDRESS			
1248 Kinneys Lane			
CITY	STATE	ZIP CODE	
Portsmouth,	OH	45662	

## 2. CLINICAL TRAINING AND EXPERIENCE OF ABOVE NAMED PHYSICIAN

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
I-131 or I-125	DIAGNOSIS OF THYROID FUNCTION	50	These total numbers include experience at Scioto Memorial Hospital, Portsmouth, Ohio NRC License 34-15938-01 and Mercy Hospital, Portsmouth, Ohio NRC License 34-18776-01
	DETERMINATION OF BLOOD AND BLOOD PLASMA VOLUME		
	LIVER FUNCTION STUDIES		
	FAT ABSORPTION STUDIES		
	KIDNEY FUNCTION STUDIES	25	
	IN VITRO STUDIES		
OTHER			
I-125	DETECTION OF THROMBOSIS		
I-131	THYROID IMAGING	50	
P-32	EYE TUMOR LOCALIZATION		
Sr-75	PANCREAS IMAGING		
Yb-169	CISTERNOGRAPHY		
Xe-133	BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES		
OTHER			
Tc-99m	BRAIN IMAGING	500	
	CARDIAC IMAGING	5	
	THYROID IMAGING	10	
	SALIVARY GLAND IMAGING		
	BLOOD POOL IMAGING	5	
	PLACENTA LOCALIZATION		
	LIVER AND SPLEEN IMAGING	200	
	LUNG IMAGING	175	
BONE IMAGING	250		
OTHER			

**PRECEPTOR STATEMENT (Continued)**

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

ISOTOPE A	CONDITIONS DIAGNOSED OR TREATED B	NUMBER OF CASES INVOLVING PERSONAL PARTICIPATION C	COMMENTS (Additional information or comments may be submitted in duplicate on separate sheets.) D
P-32 (Soluble)	TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA, AND BONE METASTASES		These total numbers include experience at Scioto Memorial Hospital, Portsmouth, Ohio NRC License 34-15938-01 and Mercy Hospital, Portsmouth Ohio NRC License 34-18776-01
P-32 (Colloid)	INTRACAVITARY TREATMENT		
I-131	TREATMENT OF THYROID CARCINOMA		
	TREATMENT OF HYPERTHYROIDISM	3	
Au-198	INTRACAVITARY TREATMENT		
Co-60 or Cs-137	INTERSTITIAL TREATMENT		
	INTRACAVITARY TREATMENT		
I-125 or Ir-192	INTERSTITIAL TREATMENT		
Co-60 or Cs-137	TELETHERAPY TREATMENT		
Sr-90	TREATMENT OF EYE DISEASE		
	RADIOPHARMACEUTICAL PREPARATION		
Mo-99/ Tc-99m	GENERATOR	6	
Sn-113/ In-113m	GENERATOR		
Tc-99m	REAGENT KITS	6	
Other			

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

February 1980 to present  
1000 hrs.

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

a. NAME OF SUPERVISOR

George V. Johnson M.D.

b. NAME OF INSTITUTION

Mercy Hospital

c. MAILING ADDRESS

1248 Kinneys Lane

d. CITY

Portsmouth, Ohio 45662

**5. MATERIALS LICENSE NUMBER(S)**

34-18776-01

**6. PRECEPTOR'S SIGNATURE**

*George V. Johnson M.D.*

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

George V. Johnson, M.D.

**8. DATE**

11 Jan 82

# **APPENDIX C** **INSTRUMENTATION**

## 1. Survey meters

- a. Manufacturer's name: Victoreen  
 Manufacturer's model number: 493  
 Number of instruments available: 1  
 Minimum range: 0.01 mR/hr to 0.5 mR/hr  
 Maximum range: 1 mR/hr to 50 mR/hr
- b. Manufacturer's name: Victoreen  
 Manufacturer's model number: 740-F  
 Number of instruments available: 1  
 Minimum range: 0.5 mR/hr to 25 mR/hr  
 Maximum range: 500 mR/hr to 25,000 mR/hr

## 2. Dose calibrator

Manufacturer's name: Capintec  
 Manufacturer's model number: CRC 17U  
 Number of instruments available: 1

## 3. Instruments used for diagnostic procedures

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	General Electric (Maxi-Cam II)	46-400321G1
Gamma Camera	Pickier International (DynaMo)	615291-1
Scintillation Well Counter for in-vitro studies	Abbott Laboratories	101E
4. Other (e.g., liquid scintillation counter, area monitor, velocimeter)		



## CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

- X 1. Survey instruments will be calibrated at least annually and following repair.
- X 2. Calibration will be performed at two points on each scale used for radiation protection purposes, i.e., at least up to 1 R/hr.

The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within  $\pm 10$  percent of the calculated or known values for each point checked. Readings within  $\pm 20$  percent are considered acceptable if a calibration chart, graph, or response factor is prepared, attached to the instrument, and used to interpret readings to within  $\pm 10$  percent. Also, when higher scales are not checked or calibrated, an appropriate precautionary note will be posted on the instrument.

3. Survey instruments will be calibrated

- \_\_\_\_\_ a. By the manufacturer
- \_\_\_\_\_ b. At the licensee's facility

- (1) Calibration source

Manufacturer's name \_\_\_\_\_

Model no. \_\_\_\_\_

Activity in millicuries

or

Exposure rate at a specified distance \_\_\_\_\_

Accuracy \_\_\_\_\_

Traceability to primary standard \_\_\_\_\_

- \_\_\_\_\_ (2) The calibration procedures in Section I of Appendix D will be used  
or  
\_\_\_\_\_ (3) The step-by-step procedures, including radiation safety procedures, are attached.

- Y c. By a consultant or outside firm

- (1) Name James G. Kereiakes, Ph.D.

- (2) Location University of Cincinnati Medical Center

- ### (3) Procedures and sources

\_\_\_\_\_ have been approved by NRC and are on file in License No. \_\_\_\_\_

\_\_\_\_\_ have been approved by an Agreement State; a copy of the Agreement State license, the procedures, and a description of the sources are attached, and the consultant's report will contain the information on \_\_\_\_\_

\_\_\_\_\_ the attached "Certificate of Instrument Calibration."

\_\_\_\_\_ the consultant's reporting form as attached.

X are described in the attachment, and the consultant's report will contain the information on

the attached "Certificate of Instrument Calibration."

y the consultant's reporting form as attached.

# CERTIFICATE OF INSTRUMENT CALIBRATION

For:

Instrument:

Manufacturer \_\_\_\_\_

Type \_\_\_\_\_

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Calibration Data:

Scale	Exposure rate (mR/hr)	Instrument reading (mR/hr)	Exposure rate (mR/hr)	Instrument reading (mR/hr)	Exposure rate (mR/hr)	Instrument reading (mR/hr)

Comments:

	Activity or Exposure Rate at Specified Distance	Calibration Accuracy
<u>Nuclide</u>		

Calibration Source:

Calibrated by \_\_\_\_\_ Date \_\_\_\_\_

#### ION CHAMBER SURVEY METER (CUTIE PIE) CALIBRATED PROCEDURE

1. Cutie Pie is calibrated annually and calibrated following repair or battery replacement.
2. Calibration is accomplished by taking readings at various points from the calibration source and adjusting the meter readings to within  $\pm 10\%$  of the calculated exposure rates for those points. The points are chosen so that two readings, which are separated by at least 50% of the scale, are taken in each scale.
3. The calibration source used is an EON Corporation Gamma Survey Instrument Calibrator, Model 64-764, Serial No. 123, marketed by Nuclear Associates, Inc. The calibrator contains 100 mCi, and the design and manufacture meet NRC requirements (cf. enclosure).
4. Calibration done by James G. Kereiakes, Ph.D., Radiological Physicist, at the University of Cincinnati Medical Center.

SURVEY INSTRUMENT CALIBRATION

PLACE: Mercy Hospital  
Portsmouth Ohio

DATE: 1/7/1985

CALIBRATED BY: JG Kereates, Ph.D

ATTENTION: DR G JOHNSON

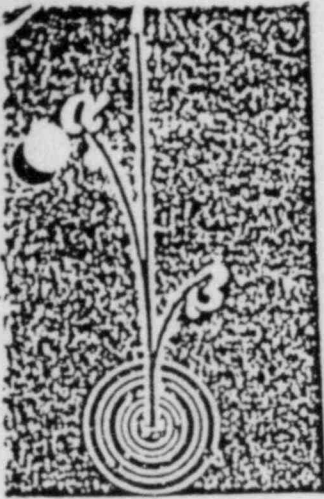
Technique: Survey meter placed at several distances from a calibration source of 100 mCi of Cs<sup>137</sup> having 0.5 mm Pt. Eq. filtration; gamma-ray constant of 0.33 mR/hr at 1 m per mCi was used; survey meter reading adjusted to calculated exposure rate reading (two calibration points per range).

Instrument	Range	Distance (inches)	Exposure Rate Calculated (mR/hr)	Meter Reading Adjusted (mR/hr)
Victoreen 740 F Ser # 2635	X100	9	367	375
		12	207	205
	X10	12	207	205
		24	52	49
	X1	48	12.9	13
		90	3.7	3.9
				Item No. 10 April 26, 1985



### G-M SURVEY METER CALIBRATION PROCEDURE

1. G-M survey meter is calibrated annually and following repair or battery replacement.
2. Calibration is accomplished by taking readings at various points from calibration source and adjusting the meter readings to within  $\pm 10\%$  of the calculated exposure rates for those points. The points are chosen so that two readings which are separated by at least 50% of the scale, are taken in each scale
3. The calibration source used is a 1 mg  $^{226}\text{Ra}$  needle manufactured by the Radium Chemical Company, Inc. Filtration is 0.5 mm Pt equivalent and the calibration of the source activity is traceable to NBS standards.
4. Calibration is done by James G. Kereiakes, Ph.D., Radiological Physicist, at the University of Cincinnati Medical Center.



# GAMMA SURVEY INSTRUMENT CALIBRATOR

## Gamma Survey Instrument Calibrator

- For use in radiation fields from 2 mR to 1 R/hr.
- Non-removable Cesium-137 source; long half-life.
- Automatic timer limits exposure periods.
- Container meets requirements of the A.E.C. and Agreement States.

This safe, sturdy, easy-to-use device permits the fast and accurate calibration of instruments used for surveying gamma radiation. It enables users of dosage-measuring equipment to perform routine checks at will or as necessary to meet the regulations of the A.E.C. and Agreement States. This simple, fool-proof system is a time and money saver . . . it does away with the expense, inconvenience and work-time lost when sending such instruments to an outside calibration service.

Consists of a heavy-duty container that holds 100 mc of Cesium-137 encapsulated at one end of a control rod. Since Cs-137 has a long half-life of 29 years, there is no need to calculate a correction factor for at least 1 or 2 years after the instrument has been received in the laboratory.

The source is kept in either of 2 positions: stored or exposed. In the fully-shielded "stored" position, radiation at the container's surface is less than 60 mr/hr; at 6" away it is less than 15 mr/hr. In the "exposed" position, the source faces a 45° port at the side of the shield, and the field can vary from 2 mr to 1 R/hr. The source is moved from "stored" to "exposed" merely by raising the control rod. For safety, the Cs-137 source cannot be removed from its shield except by the manufacturer.

For safety, the Calibrator includes a preset timer which limits the source's exposure period (1 to 60 minutes). At the expiration of the selected period, the source automatically drops to its safe storage position. Therefore, the source cannot remain exposed accidentally after an instrument has been calibrated.

Includes a built-in tape measure which helps accurately determine the distance from the Cs-137 source to the instrument being calibrated. A key-lock prevents any unauthorized use of the equipment. Convenient carrying handle. Measures 13" high x 7" 1/2". Weighs 75 lbs.

61-761 Gamma Survey Instrument Calibrator

\$515.00



61-761  
Gamma  
Survey  
Instrument  
Calibrator  
In "Stored"  
Position



In "Exposed"  
Position



**NUCLEAR ASSOCIATES, INC.**

Subsidiary of RADIATION MEDICAL PRODUCTS CORP.

35 URBAN AVENUE WESTBURY, N.Y. 11590

PHONE (516) 333-9344 • TWX 510 227 8958

Item No. 10

April, 26, 1985

# SURVEY INSTRUMENT CALIBRATION

PLACE: Mercy Hospital  
Portsmouth Ohio

DATE: 1/22/1985

ATTENTION: Dr G. Johnson

CALIBRATED BY: J. B. Kernekes, Ph.D.

Technique: Survey meter placed at several distances from a calibration source of 1 mCi Ra <sup>226</sup> having 0.5 mm Pt. eq. filtration; gamma-ray constant of 0.825 mR/hr at 1m per mCi was used; survey meter reading adjusted to calculated exposure rate reading (two calibration points per range).

Instrument	Range	Distance (cm)	Exposure Rate Calculated (mR/hr)	Meter Reading Adjusted (mR/hr)
Victoreen 493 Ser # 2003	X100	15	36.72	36
		45	4.08	4.2
	X10	45	4.08	4.1
		75	1.47	1.5
	X1	150	0.37	0.40
		200	0.201	0.22
				Item No. 10 April 26, 1985

# CALIBRATION OF DOSE CALIBRATOR

## A. Sources Used for Linearity Test

(Check as appropriate)

  X   First elution from new Mo-99/Tc-99m generator

or

           Other\* (specify) \_\_\_\_\_

## B. Sources Used for Instrument Accuracy and Constancy Tests

Radionuclide	Suggested Activity (mCi)	Activity (mCi)	Accuracy
Co-57	3-5	<u>  5.5  </u>	<u>  7.1  </u>
Ba-133	0.1-0.5	<u>  0.242  </u>	<u> 11.5  </u>
Cs-137	0.1-0.2	<u>  0.191  </u>	<u>  2.0  </u>
Ra-226	1-2	<u>          </u>	<u>          </u>
<u>Cs-137</u>		<u>  0.203  </u>	<u>  1.5  </u>

C.   X   The procedures described in Section 2 of Appendix D will be used for calibration of the dose calibrator

or

           Equivalent procedures are attached.

\*For licensees who are not authorized for Mo-99/Tc-99m generators, activity must be equivalent to the highest activity used.



The activity levels of the reference sources used should approximate those levels normally encountered in clinical use (e.g., Co-57, 3-5 millicuries) giving adequate attention to source configuration. Identify in your application the three sources that you will use. State nuclide, activity, and calibration accuracy. The lower-energy reference standards (Tc-99m, Xe-133, I-125) must be in vials with the same thickness of glass as the actual samples to be measured for best accuracy.

1. Assay the reference standard in the dose calibrator at the appropriate setting, and subtract the background level to obtain the net activity.
2. Repeat step 1 for a total of 3 determinations, and average results.
3. The average activity determined in step 2 should agree with the certified activity of the reference source within  $\pm 5$  percent after decay corrections.

4. Repeat the above steps for other commonly used radionuclides for which adequate reference standards are available.
5. Keep a log of these calibration checks.
6. Calibration checks that do not agree within  $\pm 5$  percent indicate that the instrument should be repaired or adjusted. If this is not possible, a calibration factor should be calculated for use during routine assays of radionuclides.
7. At the same time the instrument is being initially calibrated at the licensee's facility with the reference standards, place a long-lived source in the calibrator, set the instrument, in turn, at the various radionuclide settings used (Cs-137, I-131, Tc-99m, I-125, etc.), and record the readings. These values may later be used to check instrument calibration at each setting (after correcting for decay of the long-lived source) without requiring more reference standards. Keep a log of these initial and subsequent readings.

## 11. Facilities and Equipment

1. On January 5, 1984 the Nuclear Medicine Department was moved to a new location. The following pages contain information on the area surveys and wipe testing done following the relocation and before release of the rooms to the new occupants.
2. The layout diagrams for the new location (now existing) also follow.

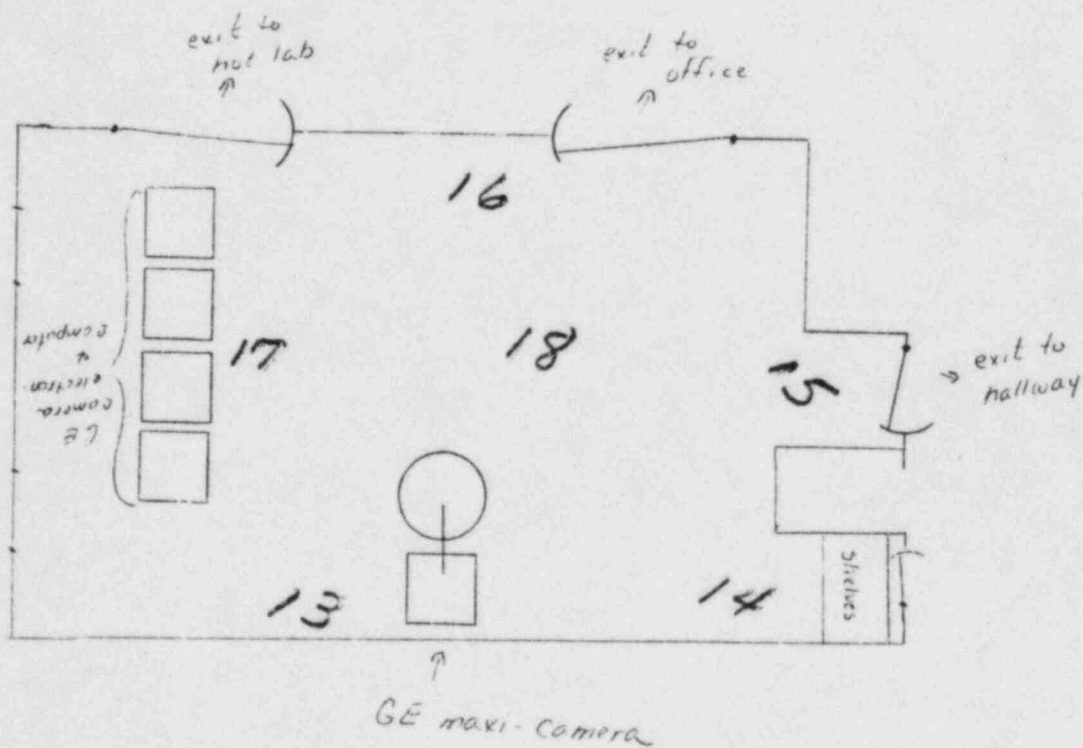
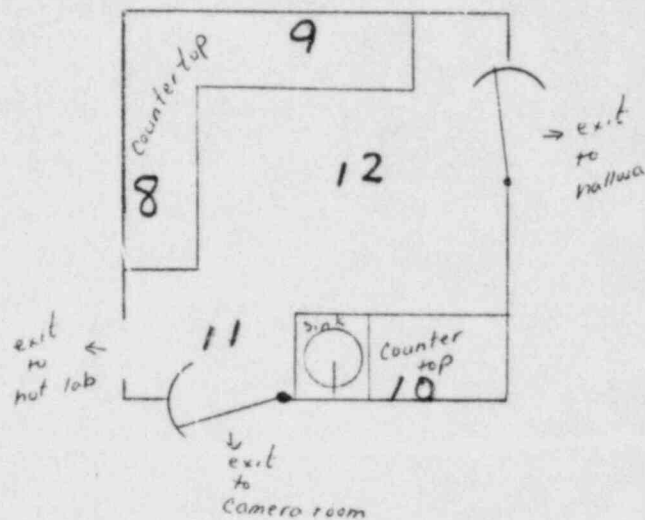
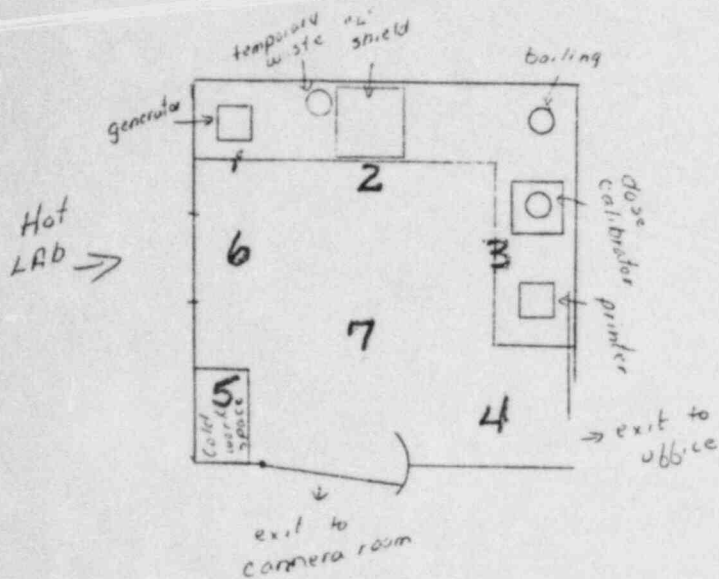
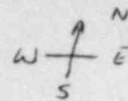
Final surface area wipes from 1/5/84. Technique follows the data.

Sample#	Area Description	Raw Counts	DPM 100cm2
BKG		381	
1	countertop near generator	369	0
2	countertop near "L" shield	351	0
3	countertop near dose calibrator and printer	347	0
4	floor near exits	395	18.7
5	countertop "cold" work space	378	0
6	floor near generator and "L" shield	358	0
7	floor near center of room	386	6.7
8	countertop on west wall	350	0
9	countertop on north wall	385	5.3
10	countertop and sink on south wall	394	17.3
11	floor near west and south exits	348	0
12	floor near center of room	376	0
13	floor near gamma camera	403	29.3
14	floor near shelves	353	0
15	floor near hallway exit	404	30.7
16	floor near north wall exits	389	10.7
17	floor near camera electronics and computer	373	0
18	floor near center of room	391	13.3

#### Protocol for surface area wipes.

1. Wipe about 100 cm2 area with moistened cotton applicator.
2. Place applicator in test tube.
3. Count tube for 2 minutes in Abbott Logic Well Counter operated at the cobalt-57 window setting.
4. Express results as counts per minute (cpm).
5. Count background for 2 minutes; express background as cpm.
6. Subtract background cpm from wipe cpm to obtain net cpm.
7. Divide wipe net cpm by counting efficiency (0.75) for cobalt-57 to obtain net dpm.
8. Express results as wipe dpm/100cm2 area.
9. Area will be cleaned if the contamination level exceeds 200dpm/100cm2.

# Wipe Test

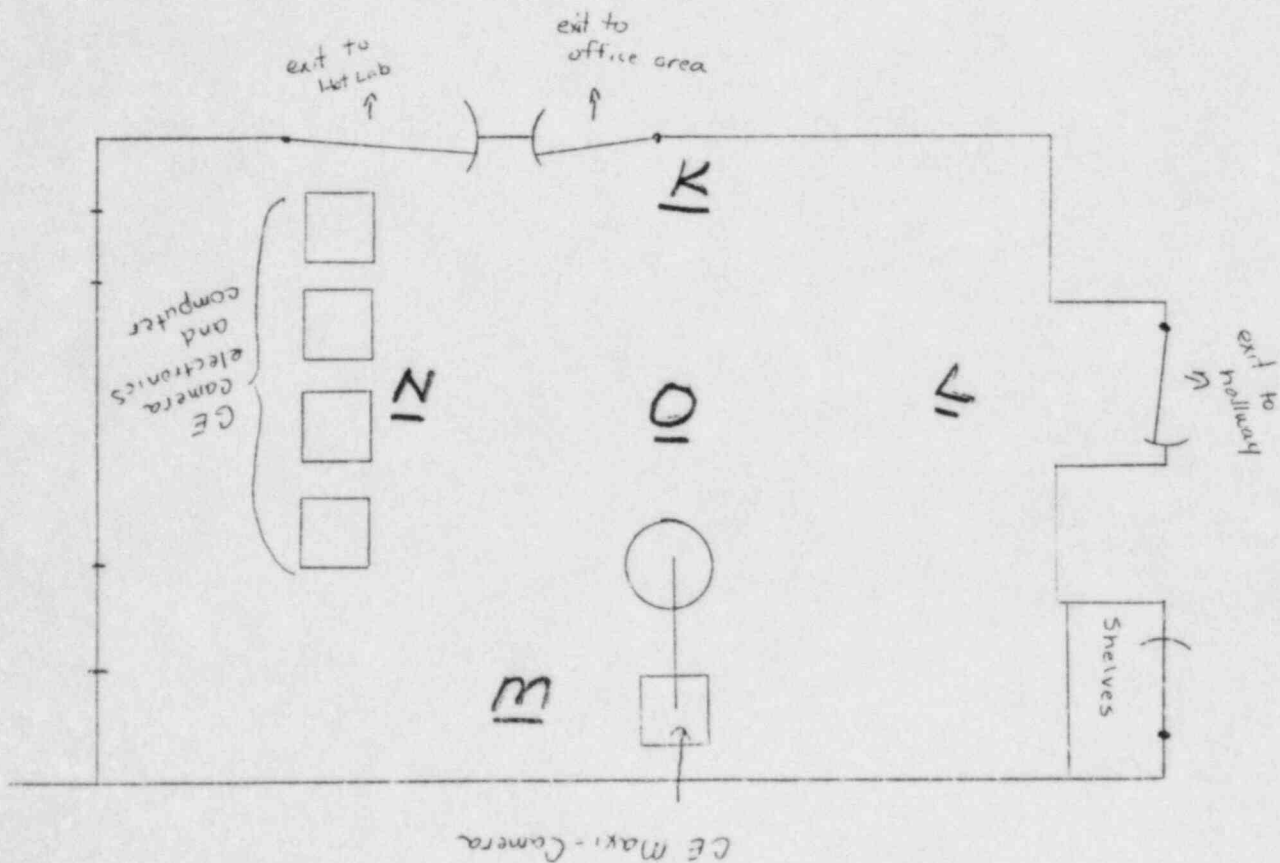
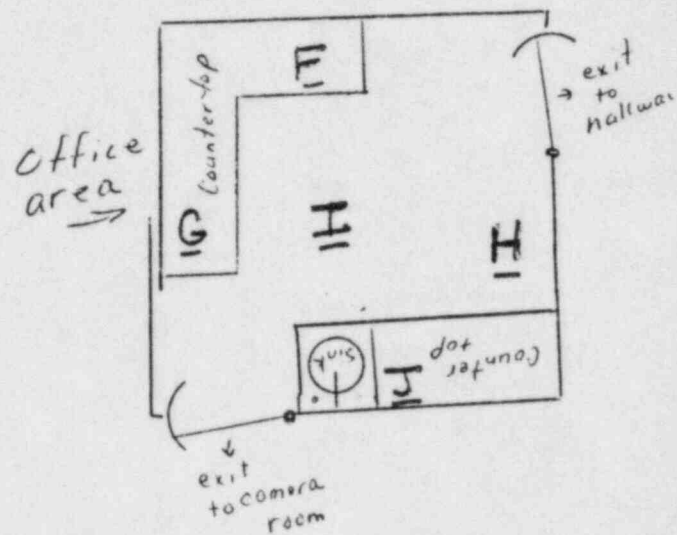
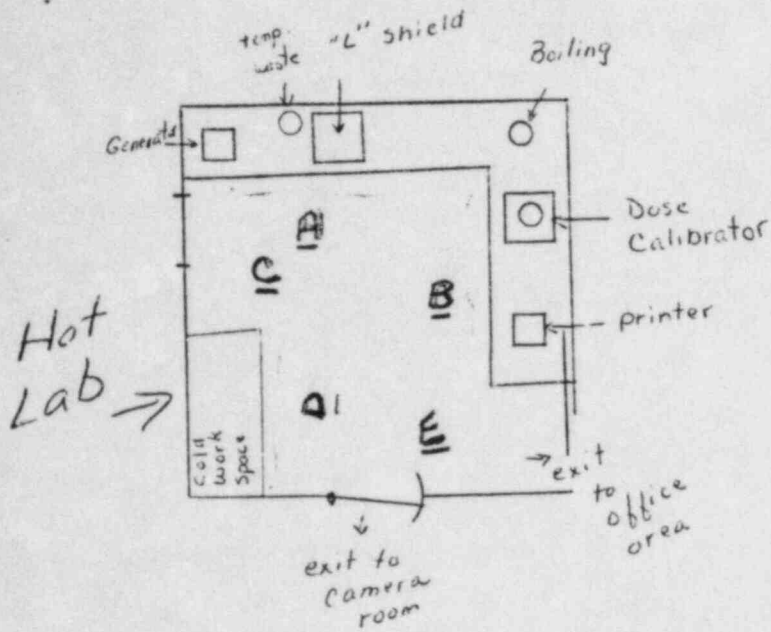
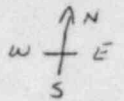




Final area survey results from 1/5/84. Instrument used Victoreen model 493 survey meter serial #2003 at x 1.

Area and description	mr/hr
a) countertop at generator and "L" shield	.01
b) countertop at dose calibrator and printer	.01
c) floor near generator and "L" shield	.01
d) countertop at cold work space	.01
e) floor near both exits	.01
f) countertop at north wall	.01
g) countertop at west wall	.01
h) floor near countertop and exit	.01
i) floor near sink and exit	.01
j) countertop and sink	.01
k) floor near exits on north wall	.01
l) floor near exit on east wall	.01
m) floor near gamma camera	.01
n) floor near gamma camera electr. and computer	.01
o) floor near center of room	.01

# Area Survey



Instrument used: Victoreen Model 493 Survey Meter  
 Serial #2003  
 at x1

Item No. 11  
 April 26, 1985

1/5/84 DB

# Existing Facility

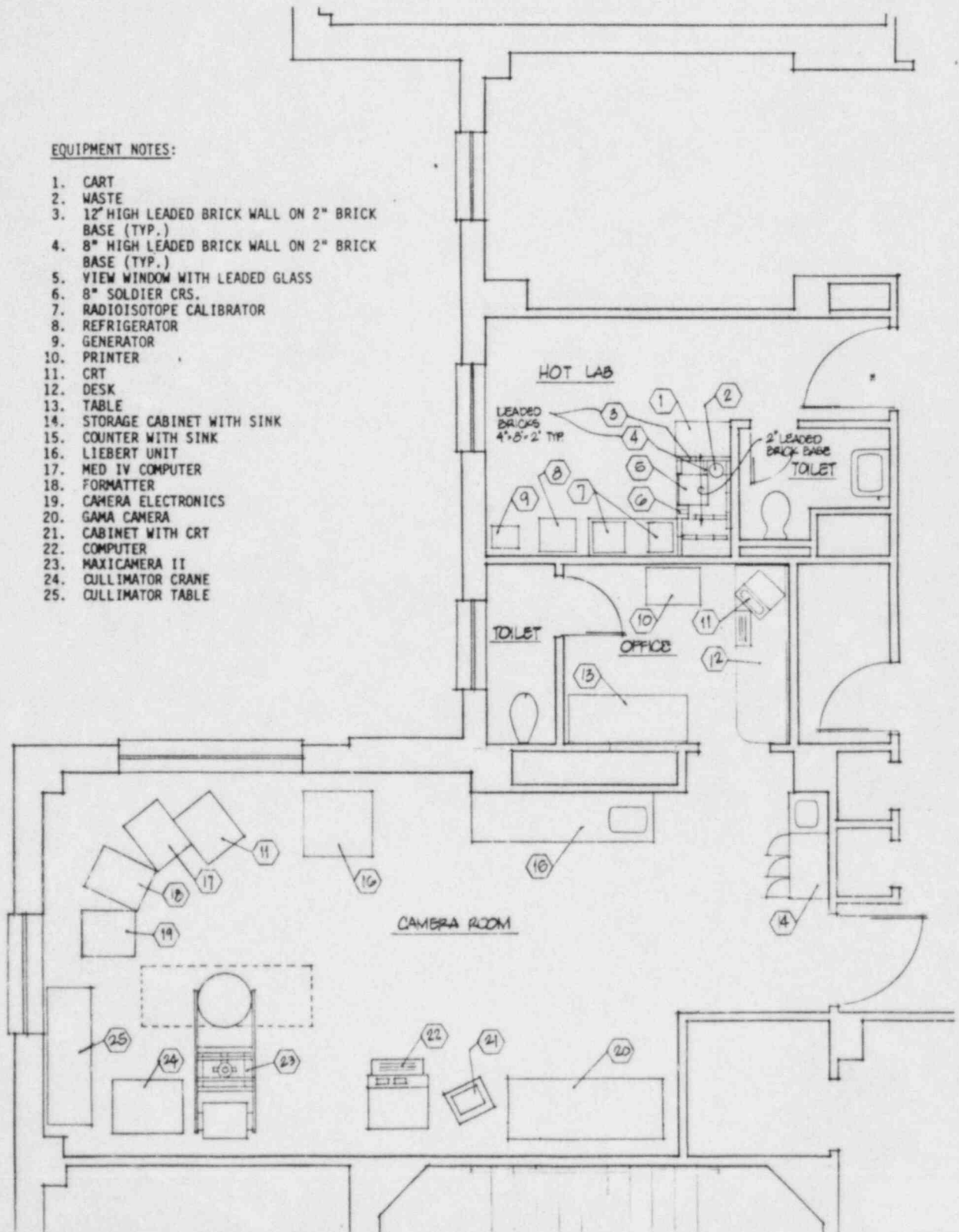
MERCY HOSPITAL  
1248 KINNETTS LANE  
PORTSMOUTH, OHIO  
23, APRIL 85

NUCLEAR MEDICINE DEPT.  
SCALE 1/4" = 1'-0"



## EQUIPMENT NOTES:

1. CART
2. WASTE
3. 12" HIGH LEADED BRICK WALL ON 2" BRICK BASE (TYP.)
4. 8" HIGH LEADED BRICK WALL ON 2" BRICK BASE (TYP.)
5. VIEW WINDOW WITH LEADED GLASS
6. 8" SOLDIER CRS.
7. RADIOISOTOPE CALIBRATOR
8. REFRIGERATOR
9. GENERATOR
10. PRINTER
11. CRT
12. DESK
13. TABLE
14. STORAGE CABINET WITH SINK
15. COUNTER WITH SINK
16. LIEBERT UNIT
17. MED IV COMPUTER
18. FORMATTER
19. CAMERA ELECTRONICS
20. GAMA CAMERA
21. CABINET WITH CRT
22. COMPUTER
23. MAXICAMERA II
24. COLLIMATOR CRANE
25. COLLIMATOR TABLE



## 12. PERSONNEL TRAINING PROGRAM

Nuclear Medicine technologists receive on-the-job training from staff radiologists (continued post-graduate training in x-ray technology, including Nuclear Medicine lectures). Attendance by staff radiologists of national meetings (Radiological Society of North America, American Roentgen Ray Society, etc.). Attendance by staff radiologists and Nuclear Medicine technologists at seminars.

Personnel (including technical, clerical, nursing, housekeeping, and security) receive proper instructions in items including:

- a. Areas where radioactive material is used or stored
- b. Potential hazards associated with radioactive material
- c. Radiological safety procedures appropriate to their respective duties
- d. Pertinent NRC regulations
- e. Rules and regulations of the licensee
- f. Pertinent terms of the license
- g. Their obligation to report unsafe conditions
- h. Appropriate response to emergencies or unsafe conditions
- i. Their right to be informed of their radiation exposure and bioassay results
- j. Locations where the licensee has posted or made available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions

Personnel are properly instructed:

- a. Before assuming duties with or in the vicinity of radioactive materials
- b. During annual refresher training
- c. Whenever there is a significant change in duties, regulations, or the terms of the license.

Educational materials include Regulatory Guide 10.8 "Guide for the Preparation of Applications for Medical Programs" and NCRP Report Nos. 37, 39, 40, 48, 53, 54 and 57.



13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL

1. The Nuclear Medicine Technologist in charge places all orders for radioactive material and ensures that the requested materials and quantities are authorized by the license and that possession limits are not exceeded.
2. During normal working hours, packages containing radioactive materials will be immediately delivered directly to the Nuclear Medicine Technologist in charge.
3. During off-duty hours, security personnel will accept delivery of radioactive packages and deliver them immediately to the Nuclear Medicine Department inside the door in room #314. (See attached instructions given to security personnel at an annual inservice for acceptance of radioactive packages)

## Procedure for Proper Handling and Transport of Packages Containing Radioactive Materials

### Handling

All packages shall be inspected for possible damage before allowing the carrier to leave. If the package is wet or appears to be damaged, IMMEDIATELY contact the hospital Radiation Safety Officer, or his deputy. Ask the carrier to remain at the hospital until it can be determined that neither he nor the delivery vehicle is contaminated. If the package appears undamaged, accept delivery and allow the carrier to leave. Immediately deliver the package to the Nuclear Medicine Department room #314 and lock the door.

### Transport

Packages containing radioactive materials should not be hand carried to the appropriate location, but should be transported on a cart or dolly with approximately three feet of distance between the package and personnel transporting the material.

### Hospital Radiation Officer

George V. Johnson, M.D.      353-2131 ext. 278      (home 354-5708)

### Deputy

Patricia O. Bracknell, CNMT      353-2131 ext. 278      (home 354-4340)

**APPENDIX J**  
**WASTE DISPOSAL**

**Note:** In view of the recent problems with shallow-land burial sites used by commercial waste disposal firms, NRC is encouraging its licensees to reduce the volume of wastes sent to these facilities. Important steps in volume reduction are to segregate radioactive from nonradioactive waste, to hold short-lived radioactive waste for decay in storage, and to release certain materials in the sanitary sewer in accordance with § 20.303 of 10 CFR Part 20.

**1. Liquid waste will be disposed of (check as appropriate)**

- ☒ In the sanitary sewer system in accordance with § 20.303 of 10 CFR Part 20. See attachment
- ☐ By commercial waste disposal service (see also Item 4 below).
- ☐ Other (specify): \_\_\_\_\_

**2. Mo-99/Tc-99m generators will be (check as appropriate)**

- ☒ Returned to the manufacturer for disposal.
- ☐ Held for decay\* until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the generators will be disposed of as normal trash.\*\*

\* Be sure that waste storage areas were described in Item 11 and that they are surveyed periodically (Item 17).

\*\* These generators may contain long-lived radiolabeled contaminants. Therefore, the generator columns will be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

☐ Disposed of by commercial waste disposal service (see also Item 4 below).

☐ Other (specify): \_\_\_\_\_

**\* 3. Other solid waste will be (check as appropriate)**

☒ Held for decay\* until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding removed, have reached background levels. All radiation labels will be removed or obliterated, and the waste will be disposed of in normal trash.

☐ Disposed of by commercial waste disposal service (see also Item 4 below).

☐ Other (specify): \_\_\_\_\_

**4. The commercial waste disposal service used will be**

\_\_\_\_\_  
(Name) (City, State)

NRC/Agreement State License No. \_\_\_\_\_

MERCY HOSPITAL  
PORTSMOUTH, OHIO

RADIOACTIVE WASTE (SEWERAGE)  
PERMISSIBLE DAILY DISPOSAL (mCi)

Assume: Average water flow of 500 liters per day per bed, 200 bed hospital,  
daily flow of 100000 liters per day

<u>RADIONUCLIDE</u>	<u>PERMISSIBLE DAILY WATER CONCENTRATION <math>\mu\text{Ci/ml}</math></u>	<u>PERMISSIBLE DAILY DISPOSAL mCi</u>
H 3	$1 \times 10^{-1}$ (S)	$1 \times 10^4$
	$1 \times 10^{-1}$ (I)	$1 \times 10^4$
C 14	$2 \times 12^{-2}$ (S)	$2 \times 10^3$
	$5 \times 10^{-4}$ (S)	$5 \times 10^{-1}$
P 32	$7 \times 10^{-4}$ (I)	$7 \times 10^1$
	$5 \times 10^{-2}$ (S)	$5 \times 10^3$
Cr 31	$5 \times 10^{-2}$ (I)	$5 \times 10^3$
	$2 \times 10^{-2}$ (S)	$2 \times 10^3$
Co 57	$1 \times 10^{-2}$ (I)	$1 \times 10^3$
	$1 \times 10^{-3}$ (S)	$1 \times 10^2$
Co 60	$1 \times 10^{-3}$ (I)	$1 \times 10^2$
	$2 \times 10^{-2}$ (S)	$2 \times 10^3$
Fe 55	$7 \times 10^{-2}$ (I)	$7 \times 10^3$
	$2 \times 10^{-3}$ (S)	$2 \times 10^2$
Fe 59	$2 \times 10^{-3}$ (I)	$2 \times 10^2$
	$9 \times 10^{-3}$ (S)	$9 \times 10^2$
Se 75	$8 \times 10^{-3}$ (I)	$8 \times 10^2$
	$5 \times 10^{-3}$ (S)	$5 \times 10^2$
Mo 99	$1 \times 10^{-3}$ (I)	$1 \times 10^2$
	$2 \times 10^{-1}$ (S)	$2 \times 10^4$
Tc 99m	$8 \times 10^{-2}$ (I)	$8 \times 10^3$
	$4 \times 10^{-2}$ (S)	$4 \times 10^3$
In 113m	$4 \times 10^{-2}$ (I)	$4 \times 10^3$
	$4 \times 10^{-5}$ (S)	$4 \times 10^2$
I 125	$6 \times 10^{-3}$ (I)	$6 \times 10^2$
	$6 \times 10^{-5}$ (S)	$6 \times 10^2$
I 131	$2 \times 10^{-3}$ (I)	$2 \times 10^2$
	$4 \times 10^{-4}$ (S)	$4 \times 10^1$
Cs 137	$1 \times 10^{-3}$ (I)	$1 \times 10^2$
	$2 \times 10^{-3}$ (S)	$2 \times 10^2$
Au 198	$1 \times 10^{-3}$ (I)	$1 \times 10^2$
	$9 \times 10^{-3}$ (S)	$9 \times 10^2$
Tl 201	$5 \times 10^{-3}$ (I)	$5 \times 10^2$

\* permissible daily disposal at institutional sewerage outfall (based on  
10 CFR Part 20.303)

TOTAL ANNUAL DISPOSAL OF ALL ISOTOPES INTO SEWER MUST NOT EXCEED 1 CURIE PER YEAR



19. PROCEDURES FOR USE OF GROUPS IV AND V PHARMACEUTICALS  
FOR TREATMENT OF PATIENTS

1. All patients treated with iodine-131 or gold-198 are placed in a private room with a toilet.
2. The patient's room is properly posted in accordance with Section 20.203, 10 CFR Part 20.
3. Surveys of the patient's room and surrounding areas are conducted as soon as practicable after administration of the treatment dose. Exposure rates are measured at the patient's bedside, three feet away from the patient's bedside, and at the entrance to the room. The radiation Safety Officer or his designate then determines how long a person may remain at these positions and posts these items in the patient's chart and on his door.
4. The form "Nursing Instructions for Patients Treated with Phosphorus-32, Gold-198, or Iodine-131" is completed immediately after administration of the treatment dose. A copy is posted in the patient's chart.
5. Radiation levels in unrestricted areas are maintained less than the limits specified in Section 20.105(b), 10 CFR Part 20.
6. All linens are surveyed for contamination before being removed from the patient's room and, if necessary, are held for decay.
7. Disposable plates, cups, eating utensils, tissue, surgical dressings, and other similar waste items are placed in a specially designated container. The material is collected daily by the Radiation Safety Officer or his designate, checked for contamination and disposed of as normal or radioactive waste, as appropriate.
8. Non-disposable items used for these patients are held in plastic bags in the patient's room and checked for contamination by the Radiation Safety Officer or his designate. Items are returned for normal use, held for decay or decontamination, as appropriate.
9. Urine and vomitus from iodine-131 therapy patients are stored for decay in our radioactive waste storage area. When it reaches background levels as measured with a low-level survey meter, it is released to the sanitary sewer system.
10. Before a therapy patient's room is reassigned to another patient, the room is surveyed for contamination, decontaminated if necessary, and all radioactive waste and waste containers removed.

## 11. Nursing Instructions

- a. Nurses spend only that amount of time near the patient required for ordinary nursing care. Special restrictions are noted on the precaution sheet in the patient's chart. Nurses read these instructions before administering to the patients. Nurses are asked to call the Nuclear Medicine Laboratory if they have questions about the care of these patients.
- b. Visitors are limited to those 18 years of age or over.
- c. Patients remain in bed while visitors are in the room and visitors remain at least three feet from the patient.
- d. Radioactive patients are confined to their rooms except for special medical or nursing purposes approved by the Nuclear Medicine Laboratory.
- e. No nurse, visitor, or attendant who is pregnant is permitted in the room of a patient who has received a therapeutic amount of radioactivity until the patient no longer presents a radiation hazard. Female visitors are asked whether they are pregnant.
- f. Attending personnel wear rubber or disposable plastic gloves when handling urinals, bedpans, emesis basins or other containers having any material obtained from the body of the patient. Gloves are washed before removing and then hands are washed. The gloves are left in the patient's room in the designated waste container.
- g. Disposable items are used in the care of these patients, whenever possible. These items are placed in the designated waste container. The Nuclear Medicine Laboratory is contacted for proper disposal of the contents of the designated waste container.
- h. All clothes and bed linens used by the patient are placed in the laundry bag provided and left in the patient's room to be checked by the Nuclear Medicine Laboratory.
- i. All non-disposable items are placed in a plastic bag and left in the patient's room to be checked by the Nuclear Medicine Laboratory.
- j. Surgical dressings are changed only as directed by the physician. Dressings which indicate leakage of material are collected in plastic bags and turned over to the Nuclear Medicine Laboratory. These dressings are handled only with tongs or tweezers. Disposable gloves are worn.

k. For Iodine-131 Patients

- (1) Urine from iodine-131 patients is collected in special containers provided by the Nuclear Medicine Laboratory. The patient is encouraged to collect his own urine in the container. If the patient is bedridden, a separate urinal or bedpan is provided. The urinal or bedpan is flushed several times with hot soapy water after use.
  - (2) If the nurse helps to collect the excreta, she wears disposable gloves. Afterwards she washes her hands with the gloves on and again after the gloves are removed. The gloves are placed in the designated waste container for disposal by the Nuclear Medicine Laboratory.
  - (3) Disposable plates, cups and eating utensils are used by patients who are treated with iodine-131.
  - (4) In case of patient vomiting within 24 hours after oral administration, urinary incontinence, excessive sweating within the first 48 hours, or spilling of urine and/or feces during collection, Nuclear Medicine Laboratory is called, Ext. 328
  - (5) All vomitus is kept in the patient's room for disposal by the Nuclear Medicine Laboratory. The same toilet is used by the patient at all times and it is well flushed.
- l. Precautions are taken to see that no urine or vomitus are spilled on the floor or the bed. If any part of the patient's room is suspected to be contaminated, the Nuclear Medicine Laboratory is notified.
- m. If a nurse, attendant or anyone else knows or suspects that his skin or clothing, including shoes, are contaminated, the Nuclear Medicine Laboratory is immediately notified. This person remains in the patient's room. If the hands become contaminated, they are immediately washed with soap and water.
- n. If a therapy patient needs emergency surgery or dies, the Nuclear Medicine Laboratory is notified immediately.
- o. When the patient is discharged, the Nuclear Medicine Laboratory is called and requested to survey the room for contamination before the room is made up.



NURSING INSTRUCTIONS FOR PATIENTS TREATED WITH  
PHOSPHORUS-32, GOLD-198, or IODINE-131

Patient's Name \_\_\_\_\_

Room No. \_\_\_\_\_ Physician's Name \_\_\_\_\_

Radioisotope Administered \_\_\_\_\_

Date and Time of Administration \_\_\_\_\_

Dose Received \_\_\_\_\_ Method of Administration \_\_\_\_\_

\_\_\_\_\_ Exposure Rate in mR/hr \_\_\_\_\_

Date \_\_\_\_\_ 3 feet from bed \_\_\_\_\_ 10 feet from bed \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(comply with all check items)

1. Visiting time permitted \_\_\_\_\_
2. Visitors must remain \_\_\_\_\_ from patient
3. Patient may not leave room
4. Visitors under 18 not permitted
5. Pregnant visitors not permitted
6. Film badges must be worn
7. Use and complete the following tags:  
\_\_\_\_ door  
\_\_\_\_ bed  
\_\_\_\_ chart  
\_\_\_\_ wrist
8. Gloves must be worn while attending patient
9. Patient must use disposable utensils
10. All items must remain in the room until okayed by Radiation Safety
11. Smoking is not permitted
12. Do not release room to Admitting until okayed by Radiation Safety
13. Other instructions \_\_\_\_\_

IN CASE OF AN EMERGENCY CONTACT:

RSO: George V. Johnson, M.D.  
(name) \_\_\_\_\_

Telephone No: 353-2131 354-5708  
(on duty) (off duty)

Item No. 19

April 26, 1985

18916