

## EXHIBIT A

FORM NRC-313M (8-78) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION <b>APPLICATION FOR MATERIALS LICENSE – MEDICAL</b>	Approved: GAO R0557			
<b>INSTRUCTIONS</b> – 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.					
1.a. NAME AND MAILING ADDRESS OF APPLICANT (institution, firm, clinic, physician, etc.) INCLUDE ZIP CODE  Cardiovascular Center, P.C. Borgess Professional Bld., North 1717 Schaffer Street, Suite 106 Kalamazoo, Michigan 49001 TELEPHONE NO.: AREA CODE (313) 381 3963		1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED (If different from 1.a.) INCLUDE ZIP CODE  SAME (see attached list)			
2. PERSON TO CONTACT REGARDING THIS APPLICATION  Tony R. Mason, M.S. TELEPHONE NO.: AREA CODE (313) 662 3197		3. THIS IS AN APPLICATION FOR: (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. 21-18912-01			
4. INDIVIDUAL USERS (Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)  (See attached list)		5. RADIATION SAFETY OFFICER (RSO) (Name of person designated as radiation safety officer. If other than individual user, complete resume of training and experience as in Supplement A.)  E. Enrique Liguizamon, M.D.			
<b>6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE</b>					
RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)	ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
10 CFR 31.11 FOR IN VITRO STUDIES			IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM		
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		
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED	PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
10 CFR 35.100, SCHEDULE A, GROUP III	X	2500	GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
10 CFR 35.100, SCHEDULE A, GROUP IV		AS NEEDED	IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA		
10 CFR 35.100, SCHEDULE A, GROUP V		AS NEEDED	XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES.		
10 CFR 35.100, SCHEDULE A, GROUP VI					
<b>6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a.</b> (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		
B506130460 B50524 REQ3 LIC30 21-18912-01 PDR			Applicant: [Signature] Check No. 13365 Amount: Fee [Signature] Type of fee [Signature] Date Check Rec'd 9/15/85 Received By: [Signature]		

# **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. \_\_\_\_\_ Date: \_\_\_\_\_

<b>7. MEDICAL ISOTOPES COMMITTEE</b>		<b>15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)</b>	
<input type="checkbox"/>	Names and Specialties Attached; and	<input checked="" type="checkbox"/>	Appendix G Rules Followed; or
<input type="checkbox"/>	Duties as in Appendix B; or _____ (Check One)	<input type="checkbox"/>	Equivalent Rules Attached
<input type="checkbox"/>	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 type="checkbox"/>	Supplements A & B Attached for Each Individual User; and	<input type="checkbox"/>	Equivalent Procedures Attached
<input type="checkbox"/>	Supplement A Attached for RSO.	<b>17. AREA SURVEY PROCEDURES (Check One)</b>	
<b>9. INSTRUMENTATION (Check One)</b>		<input type="checkbox"/>	Appendix I Procedures Followed; or
<input checked="" type="checkbox"/>	Appendix C Form Attached; or	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
<input type="checkbox"/>	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)	<input type="checkbox"/>	Equivalent Information Attached
<input type="checkbox"/>	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)	<input type="checkbox"/>	Appendix K Procedures Followed; or
<input type="checkbox"/>	Equivalent Procedures Attached	<input 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	<input type="checkbox"/>	Detailed Information Attached; and
<b>12. PERSONNEL TRAINING PROGRAM</b>		<input type="checkbox"/>	Appendix L Procedures Followed; or _____ (Check One)
<input checked="" type="checkbox"/>	Description of Training Attached	<input type="checkbox"/>	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	<input type="checkbox"/>	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 type="checkbox"/>	Appendix F Procedures Followed; or	<input type="checkbox"/>	Detailed Information Attached
<input checked="" type="checkbox"/>	Equivalent Procedures Attached	<b>23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b</b>	
<input type="checkbox"/>		<input type="checkbox"/>	Detailed Information Attached

24. PERSONNEL MONITORING DEVICES				
TYPE <small>(Check appropriate box)</small>		SUPPLIER	EXCHANGE FREQUENCY	
a. WHOLE BODY	<input checked="" type="checkbox"/>	FILM	Siemens	Monthly
	<input type="checkbox"/>	TLD		
	<input type="checkbox"/>	OTHER (Specify)		
b. FINGER	<input type="checkbox"/>	FILM		
	<input checked="" type="checkbox"/>	TLD	Siemens	Monthly
	<input type="checkbox"/>	OTHER (Specify)		
c. WRIST	<input type="checkbox"/>	FILM		
	<input type="checkbox"/>	TLD		
	<input type="checkbox"/>	OTHER (Specify)		
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			
CITY	STATE		
		c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.	

26. CERTIFICATE <small>(This item must be completed by applicant)</small>	
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 <small>(See Section 170.31, 10 CFR 170)</small>	b. APPLICANT OR CERTIFYING OFFICIAL (Signature) <div style="text-align: center;"><input checked="" type="checkbox"/></div>
(1) LICENSE FEE CATEGORY 10 CFR 170.317 B	(1) NAME (Type of Print) E. Enrique Lopez-Sanchez, M.D. (2) TITLE
(2) LICENSE FEE ENCLOSED: \$ 580.00	c. DATE <div style="text-align: center;">MAY 09 1985</div>

STREET ADDRESSES FOR RADIOACTIVE MATERIAL USE

Licensed material shall be used and stored at 1717 Schaffer Street, Suite 106, Kalamazoo Michigan. Groups I and II will also be used at:

Lee Memorial Hospital  
420 West High Street  
Dowagiac, Michigan 49047

Community Hospital  
Medical Park  
Watervliet, Michigan 49098

Pipp Community Hospital, Inc.  
411 Naomi Street  
Plainwell, Michigan 49080

Berrien General Hospital  
1250 Deans Hill Road  
Berrien Center, Michigan 49102

Otsego Family Physicians, P.C.  
900 Dix Street  
Otsego, Michigan 49078

The above addresses were previously listed under amendment number 9 to license #21-18912-01

INDIVIDUAL USERS

E. Enrique Leguizamon, M.D.  
John E. Francis, M.D.  
William B. Campbell, M.D.  
Evalt Ayerdi, M.D.  
George J. Benisek, M.D.  
William L. Songer, M.D.  
John P. Engles, M.D.  
Aquiles G. Lire, M.D.

All the physicians above were previoulsy listed on license  
#21-18912-01

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

## 1. Survey meters

- a. Manufacturer's name: Eberline Instrument Corp.
- Manufacturer's model number: E-120
- Number of instruments available: Two (2)
- Minimum range: 0.0 mR/hr to 0.5 mR/hr
- Maximum range: 0.0 mR/hr to 50 mR/hr
- b. Manufacturer's name: Victoreen
- Manufacturer's model number: 740 - F
- Number of instruments available: \_\_\_\_\_
- Minimum range: 0.0 mR/hr to 25 mR/hr
- Maximum range: 0.0 mR/hr to 2500 mR/hr

## 2. Dose calibrator

Manufacturer's name: Capintec

Manufacturer's model number: CRC - 5

Number of instruments available: 1

## 3. Instruments used for diagnostic procedures

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	Technicare	420/550
Gamma Camera	Baird	System Seventy Seven

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



## 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

- X   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.

  X   c. By a consultant or outside firm

- (1) Name Medical Physics Consultants, Inc.
- (2) Location 3200 W. Liberty, Suite F1, Ann Arbor, MI 48103
- (3) Procedures and sources

  X   have been approved by NRC and are on file in License No. 21-20153-01

       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."

  X   the consultant's reporting form as attached.

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

       the attached "Certificate of Instrument Calibration."

       the consultant's reporting form as attached.

# Medical Physics Consultants, Inc.

3200 West Liberty, Suite F1  
Ann Arbor, Michigan 48103  
(313) 662-3197

## CERTIFICATE OF INSTRUMENT CALIBRATION

For:

Instrument:

Manufacturer-  
Type-  
Model Number-  
Serial Number-

	Nuclide	Exposure Rate at Specified Distance	Calibration Accuracy
	-----	-----	-----
Calibration Source:	Cs-137	26.0 mR/h at 1 m	+/- 3% NBS

Calibration Data:

Scale	Exposure rate (mR/h)	Instrument reading (mR/h)	Exposure rate (mR/h)	Instrument reading (mR/h)
-----	-----	-----	-----	-----

Comments:

Calibrated by:

-----

Date:

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## CALIBRATION OF DOSE CALIBRATOR

## A. Sources Used for Linearity Test

(Check as appropriate)

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

or

X Other\* (specify) Highest activity used

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

Radionuclide	Suggested Activity (mCi)	Activity (mCi)	Accuracy
Co-57	3-5	<u>1-5 mCi</u>	<u>+ 5%</u>
Ba-133	0.1-0.5	<u>          </u>	<u>          </u>
Cs-137	0.1-0.2	<u>1-5 mCi</u>	<u>+ 5%</u>
Ra-226	1-2	<u>          </u>	<u>          </u>
<u>          </u>		<u>          </u>	<u>          </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.

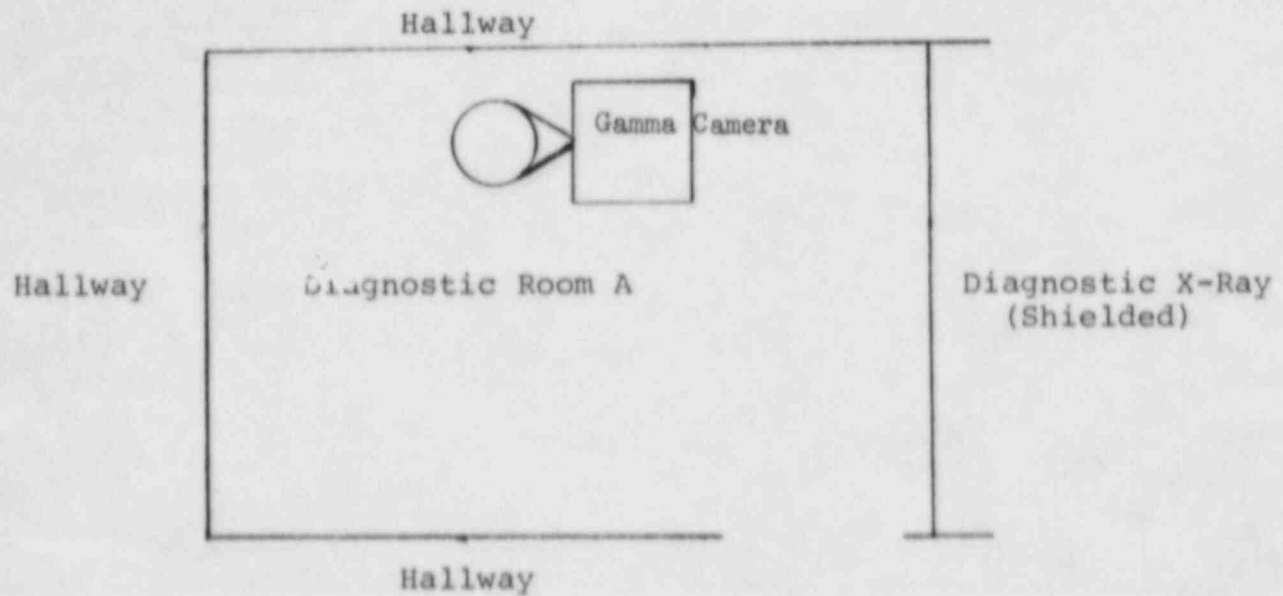
\*For licensees who are not authorized for Mo-99/Tc-99m generators, activity must be equivalent to the highest activity used.

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.

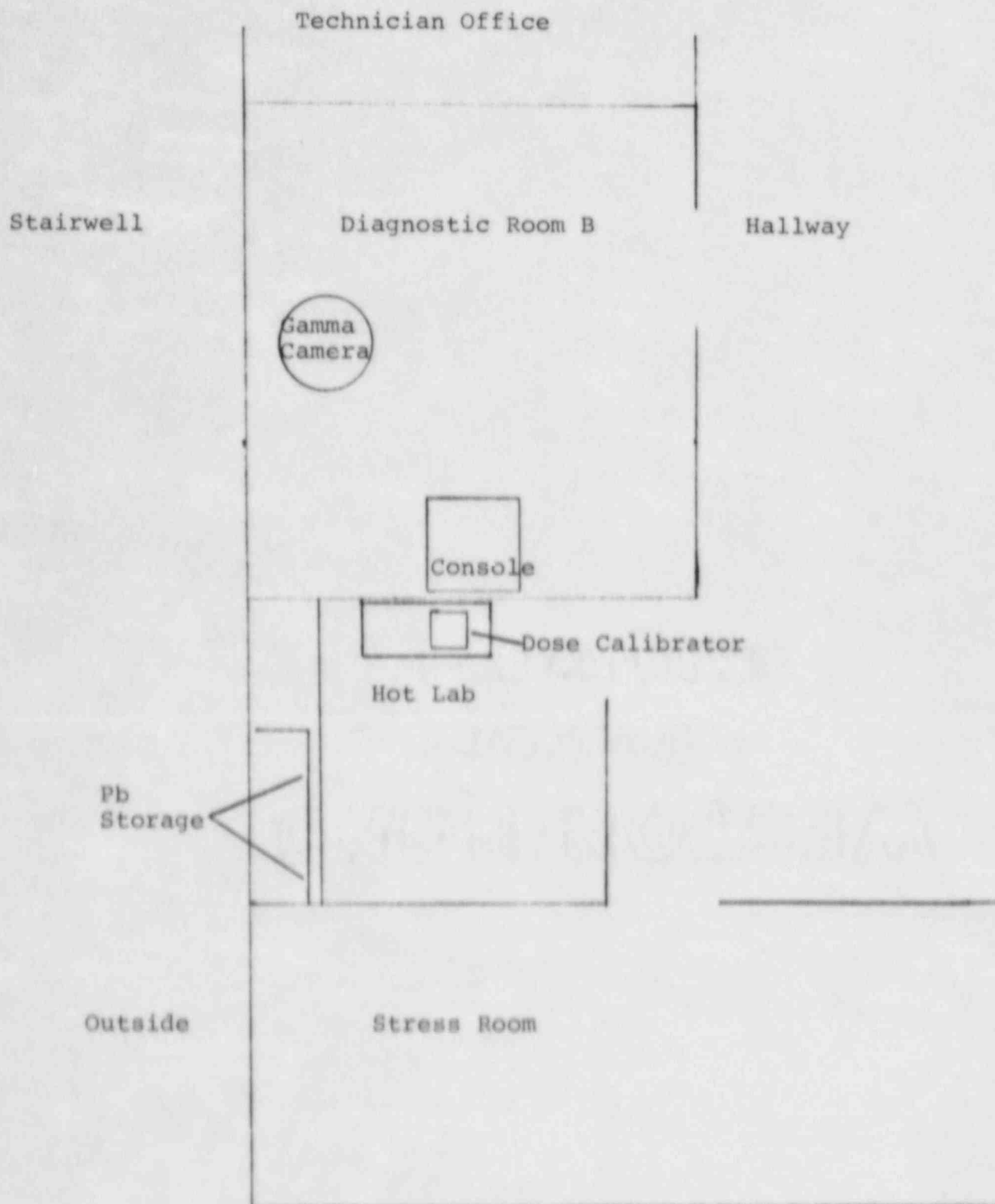
Cardiovascular Center, P.C.  
AREA DIAGRAM A



Note: Physician offices located above and below area are separated by poured concrete.

Scale: 0.25 in. = 1 ft N↑

Cardiovascular Center, P.C.  
AREA DIAGRAM B



Note: Physician offices located above and below are separated by poured concrete

Scale : 0.25 in. = 1 ft. N↑

## PERSONNEL TRAINING PROGRAM

- I. Individuals who work in or frequent restricted areas will be instructed in the items specified in 10 CFR 19.12 at the time of initial employment and at least annually thereafter.

This instruction will include:

- a. All terms of the license pertinent to radiation safety.
- b. Areas where radioactive material is used or stored.
- c. Potential hazards associated with radioactive material.
- d. Radiological safety procedures appropriate to their respective duties.
- e. Pertinent NRC regulations.
- f. Rules and regulations of the license.
- g. Obligation to report unsafe conditions to the Radiation Safety Officer.
- h. Appropriate response to emergencies or unsafe conditions.
- i. Right to be informed of their radiation exposure and bioassay results.
- j. Locations where the license has been posted or make available notices, copies of pertinent regulations, and copies of pertinent licenses and license conditions (including applications and applicable correspondence,) as required by 10 CFR Part 19.

- II. Individuals whose duties may require them to work in the vicinity of licensed material will be informed about radiation hazards and appropriate precautions at the time of initial employment and at least annually thereafter. This information will be provided initially at hospital employee orientation sessions and annually thereafter at in-service meetings.

## APPENDIX E

PROCEDURES FOR ORDERING AND ACCEPTING DELIVERY  
OF RADIOACTIVE MATERIAL

1. The Supervisory Nuclear Medicine Technologist will place all orders for radioactive materials and will ensure that the requested materials and quantities are authorized by the license and that possession limits are not exceeded.
2. A system for ordering and receiving radioactive materials will be established and maintained. The system will consist minimally of the following.
  - a. Ordering of routinely used materials
    - (1) Written records that identify the isotope, compound, activity levels, and supplier, etc., will be used.
    - (2) The written records will be referenced when opening or storing radioactive shipment.
  - b. Ordering of specially used materials (e.g., therapeutic uses)
    - (1) A written request\* will be obtained from the physician who will perform the procedure.
    - (2) Persons ordering the materials will reference the physician's written request when placing the order. The physician's request will indicate isotope, compound, activity level, etc.
    - (3) The physician's written request will be referenced when receiving, opening, or storing the radioactive material.
  - c. It is essential that written records\* be maintained for all ordering and receipt procedures.
3. During normal working hours, carriers will be instructed to deliver radioactive packages directly to the Nuclear Medicine Department.
4. During off-duty hours, security personnel or other designated individuals will accept delivery of radioactive packages in accordance with the procedures outlined in the sample memorandum below.

\* In the case of special orders, the physician's written request and appropriate shipping/receipt records will be referenced and the dose assayed prior to its administration.

## \*\*SAMPLE MEMORANDUM

MEMORANDUM FOR: Security Personnel

FROM: Facility Administrator

SUBJECT: RECEIPT OF PACKAGES CONTAINING RADIOACTIVE MATERIAL

Any package containing radioactive material that arrives between 4:30 p.m. and 7:00 a.m. or on Sundays shall be signed for by the Security Guard on duty and taken immediately to the Nuclear Medicine Department. Unlock the door, place the package on top of the counter immediately to the right of the door, and re-lock the door.

If the package is wet or appears to be damaged immediately contact the Radiation Safety Officer. Ask the carrier to remain until it can be determined that neither he nor the delivery vehicle is contaminated.

\*\*RADIATION SAFETY OFFICER \_\_\_\_\_

\*\*OFFICE PHONE \_\_\_\_\_

\*\*HOME PHONE \_\_\_\_\_

\*\*On the actual memo that is used, this information will be filled in and updated as necessary.

CONTROL NO. 78908



## APPENDIX F

PROCEDURES FOR SAFELY OPENING PACKAGES  
CONTAINING RADIOACTIVE MATERIAL

1. Special requirements will be followed for packages containing quantities of radioactive material in excess of the Type A quantity limits as specified in paragraphs 20.205(a)(1) and (c)(1) of 10 CFR Part 20 (more than 20 Ci for Mo-99 and Tc-99m). They will be monitored for surface contamination and external radiation levels within 3 hours after receipt if received during working hours or within 18 hours if received after working hours, in accordance with the requirements of paragraphs 20.205(a) through (c). All shipments of liquids greater than exempt quantities will be tested for leakage. The NRC Regional Office will be notified in accordance with the regulations if removable contamination exceeds  $0.01 \mu\text{Ci}/100 \text{ cm}^2$  or if external radiation levels exceed 200 mR/hr at the package surface or 10 mR/hr at 3 feet (or 1 m).
  - (2) Open inner package and verify that contents agree with those on packing slip. Compare requisition,\* packing slip, and label on bottle.
  - (3) Check integrity of final source container (i.e., inspect for breakage of seals or vials, loss of liquid, and discoloration of packaging material).
  - (4) Check also that shipment does not exceed possession limits.
2. For all packages, the following additional procedures for opening packages will be carried out:
  - a. Put on gloves to prevent hand contamination.
  - b. Visually inspect package for any sign of damage (e.g., wetness, crushed). If damage is noted, stop procedure and notify Radiation Safety Officer.
  - c. Measure exposure rate at 3 feet (or 1 m) from package surface and record. If  $>10 \text{ mR/hr}$ , stop procedure and notify Radiation Safety Officer.
  - d. Measure surface exposure rate and record. If  $>200 \text{ mR/hr}$ , stop procedure and notify Radiation Safety Officer.
  - e. Open the package with the following precautionary steps:
    - (1) Open the outer package (following manufacturer's directions, if supplied) and remove packing slip.
    - f. Wipe external surface of final source container and remove wipe to low background area. the wipe and record amount of removable radio-  
Check wipes with a thin-end-window G-M survey meter, and take precautions against the spread of contamination as necessary.
    - g. Monitor the packing material and packages for contamination before discarding.
      - (1) If contaminated, treat as radioactive waste.
      - (2) If not contaminated, obliterate radiation labels before discarding in regular trash.
3. Maintain records of the results of checking each package, using "Radioactive Shipment Receipt Record" (see next page) or a form containing the same information.

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\* In the case of special orders (e.g., therapy doses), also compare with physician's written request.

# APPENDIX I

## AREA SURVEY PROCEDURES

1. All elution, preparation, and injection areas will be surveyed daily with an appropriately low-range survey meter and decontaminated if necessary.\*
2. Laboratory areas where only small quantities of radioactive material are used (less than  $200 \mu\text{Ci}$ ) will be surveyed monthly.
3. Waste storage areas and all other laboratory areas will be surveyed weekly.
4. The weekly and monthly surveys will consist of:
  - a. A measurement of radiation levels with a survey meter sufficiently sensitive to detect  $0.1 \text{ mR/hr}$ .
  - b. A series of wipe tests to measure contamination levels. The method for performing wipe tests will be sufficiently sensitive to detect  $200 \text{ dpm per } 100 \text{ cm}^2$  for the contaminant involved. Wipes of elution and preparation areas or other "high background" areas will be removed to a low background area for measurement.
5. A permanent record will be kept of all survey results, including negative results. The record will include:
  - a. Location, date, and identification of equipment used, including the serial number and pertinent counting efficiencies.
  - b. Name of person conducting the survey.
  - c. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc.
  - d. Measured exposure rates, keyed to location on the drawing (point out rates that require corrective action).
  - e. Detected contamination levels, keyed to locations on drawing.
  - f. Corrective action taken in the case of contamination or excessive exposure rates, reduced contamination levels or exposure rates after corrective action, and any appropriate comments.
6. Area will be cleaned if the contamination level exceeds  $200 \text{ dpm}/100 \text{ cm}^2$ .

\* For daily surveys where no abnormal exposures are found, only the date, the identification of the person performing the survey, and the survey results will be recorded.

MODIFICATION: Items 4.b. and 6. should be modified to read that "Any areas indicating removable contamination above background, upon wipe testing, will be cleaned." (Eliminating the  $200 \text{ dpm per } 100 \text{ cm}^2$  statement.)

Wipe tests will be checked with a G-M survey meter on its most sensitive scale. A background reading will be recorded with each wipe test result. The wipe will be checked in an area with background less than  $0.05 \text{ mR/hr}$ .

## 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.

☐ By commercial waste disposal service (see also Item 4 below).

☒ Other (specify): Returned to Radio-pharmaceutical Supplier

## 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 radioknotopic 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): Returned to Radio-pharmaceutical Supplier

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

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

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

## MOBILE NUCLEAR MEDICINE

We wish to continue our mobile nuclear medicine service. The addresses previously approved for use are listed in amendment number 9 to our license and at the beginning of this renewal application. The original letter we sent to you with explanation of our mobile service was dated October 15, 1982.