EXHIBIT A

FORM NRC-313M (8-78) 10 CFR 35	U.S. NUCLEAR REGULATORY COMMISSION APPLICATION FOR MATERIALS LICENSE – MEDICAL	Approved GAO R0557

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.*

1.a. NAME AND MAILING ADDRESS OF APPLICANT *(Institution, firm, clinic, physician, etc.)* INCLUDE ZIP CODE

Elizabeth General Hospital
925 East Jersey Steet
Elizabeth, NJ 07201
TELEPHONE NO.: AREA CODE (201) 558 8054

1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED *(If different from 1.a.)* INCLUDE ZIP CODE

925 East Jersey Street
Elizabeth, New Jersey 07201

2. PERSON TO CONTACT REGARDING THIS APPLICATION

Steve Kaplan
TELEPHONE NO.: AREA CODE (201) 558 8054

3. THIS IS AN APPLICATION FOR: *(Check appropriate item)*

a. ☐ NEW LICENSE
b. ☐ AMENDMENT TO LICENSE NO. _____
c. ☒ RENEWAL OF LICENSE NO. 29-01600-02

4. INDIVIDUAL USERS *(Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)*

See Supplement

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.)*

Robert Silbey M.D.

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE

RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
10 CFR 31.11 FOR IN VITRO STUDIES	X	5 mci
10 CFR 35.100, SCHEDULE A, GROUP I	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP III	X	2 Ci
10 CFR 35.100, SCHEDULE A, GROUP IV		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP V		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP VI		

ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS (In millicuries)
IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM		
PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES		
PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA		
XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES	X	150 Mci

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

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 seperate 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: _____

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

24. PERSONNEL MONITORING DEVICES

TYPE (Check appropriate box)			SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	X	FILM	R.S. Landauer & Co.	Monthly
		TLD		
		OTHER (Specify)		
b. FINGER		FILM		
	X	TLD	R.S. Landauer & Co.	Monthly
		OTHER (Specify)		
c. WRIST		FILM		
		TLD		
		OTHER (Specify)		

d. OTHER (Specify)

ALARA Program

We, the management of this medical facility are committed to the ALARA program as specified in Appendix O, of Regulatory Guide 10.8, Rev. 1, October 1980.

25. FOR PRIVATE PRACTICE APPLICANTS ONLY

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

MAILING ADDRESS

CITY | STATE | ZIP CODE

b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.

c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.

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 *(See Section 170.31, 10 CFR 170)*

(1) LICENSE FEE CATEGORY:

(2) LICENSE FEE ENCLOSED: $ 580.00

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)* X Robert Platt

(1) NAME *(Type of Print)* ROBERT PLATT

(2) TITLE VICE PRESIDENT

c. DATE 2/25/85

NRC FORM 313M (9-81)

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 313. 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, 32, 33, 34, 35 and 40 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 (a) provided to State health departments for their information and use; and (b) provided 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 an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.

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. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.

5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

RADIOISOTOPE COMMITTEE

ROBERT SILBEY, M.D. - CHAIRMAN

IRVING CARNO, M.D.	-	ATTENDING, DEPARTMENT OF MEDICINE
HARRY CRAMER, M.D.	-	ATTENDING, DEPARTMENT OF MEDICINE
MYROSLAW CHOMA, M.D.	-	ASST. ATTENDING, DEPT. OF OB/GYN
BELA DER, M.D.	-	SR. ATTENDING, DEPT. OF PATHOLOGY
SAMIAPPAN MUTHUSAMY, M.D.	-	ASSOCIATE ATTENDING, DEPT. OF MEDICINE

ITEM 7
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INSTRUMENT LISTING

1 - G.E. Portable Gamma Camera IIC

1 - G.E. Maxi Camera # 1704, Model 2047-5131

1 - Adac Computer

1 - Nuclear Chicago Well Counter 3037B, 026234 Scaler

1 - Nuclear Chicago Uptake Probe Serial # Not Available

1 - Dose Calibrator Capintec CRC-10M, #10M21

1 - Ventilation Hood, Labconco Catalog 47810, Serial # 53384

24 - Lead Bricks

Remote Handling Equipment

1 - Lead Paint Analyzer, Serial # 187, Model XK-2

1 - Atomic Products Corp. Xenon Trap Model 130-500

1 - Victoreen Cutie Pie, Serial # 762, Model # 470

1 - G.M. Meter (Victoreen) # 3312, Model # 490

1 - G.M. (Technical Associates) Serial 072182, Model PUG-1
Sensitivity 0.01 mR/hr. -- 15 mR/hr.

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CALIBRATION OF INSTRUMENTS

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. 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 + 10% of the calculated or known values for each point checked. Readings within + 20% are considered acceptable if a calibration chart or graph is prepared and attached to the instrument.

__X__ 3. Survey instruments will be calibrated.

_____ a. By manufacturer

_____ b. At the licensee's facility

(i) Calibration source
Manufacturer's name _____
Model No. _____
Activity in millicuries _____
Accuracy _____
Traceability to primary standard _____

(ii) The calibration procedures in Appendix D, Section I will be used.

or

(iii) The step-by-step procedures, including radiation safety procedures are attached.

__X__ c. By a consultant or outside firm

(i) Name Bio-Med Associates, Inc.

(ii) Location 753 Boulevard, Kenilworth, N.J. 07033

(iii) Procedures and sources

__X__ have been approved by NRC and are on file in License No. 29-14967-01

_____ are attached.

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MONTH: ______________________

DOSE: CALIBRATE QUALITY CONTROL

DATE	CO^{57}	Cs^{137}	Tc^{99m}	I^{131}	Tl^{201}	Ga^{67}	Xe^{133}	IN^{111}	Mo^{99m}	BK

Item 10

DATE:_____

MODEL DOSE CALIBRATOR:_____

1. Check liner:
   a. Contaminate? ____yes ____no
   b. In place? ____yes ____no
2. Check support:
   a. Intact? ____yes ____no
3. Instrument Zero:
   a. Zeroed (for Tc-99m)? ____yes ____no
   b. Adjustment necessary? ____Yes ____no
   c. Linearity acceptable? ____yes ____no
4. Lead shielded? ____yes ____no
5. _____reference standard is _____uCi today. The following readings were obtained on the settings listed below:

ACTUAL READING	REF.	SETTING	CAP.	EON	PICK.	% DIFFERENT FROM REFERENCE
_____	_____	Mo-99	30x3.5	342	2133	_____
_____	_____	Tc-99	80	501	1117	_____
_____	_____	Ga-67	94	478	1139	_____
_____	_____	Co-57	112	453	1138	_____
_____	_____	I-131	151	327	1194	_____
_____	_____	Xe-133	188	497	1205	_____
_____	_____	Tl-201	205	458	____	_____
_____	_____	Cs137	220	260	1253	_____
_____	_____	Se-75	258	210	1236	_____
_____	_____	I-123	277	260	____	_____
_____	_____	I-125	319	421	0151	_____
_____	_____	Co-60	990	035	0218	_____
_____	_____	_____	____	____	____	_____

DATE OF INITIAL BASELINE MEASUREMENTS:_____, FACTOR= _____

6. Comparison of Pushbutton to Manual setting_____,_____, or N/A
7. Yes_____ No_____ Instrument was adjusted or repaired, to read ± 5%
   Yes_____ No_____ Instrument was within ±5% of previous values
   Yes_____ No_____ A correction factor was posted. It is _____
8. ACCURACY OF STANDARDS
   Decay corrected expected uCi/assay x 100 = % accuracy

Radionuclide	Test 1	Test 2	Test 3	Average
Cobalt 57	_____	_____	_____	_____
Cesium 137	_____	_____	_____	_____
Barium 133	_____	_____	_____	_____
Cobalt 60	_____	_____	_____	_____

9. COMMENTS:

CHECKED BY:_____

Methods for Calibration of Dose Calibrator

1. Instrument constancy with 137 Cesium
   frequency: daily

   All values are logged. The 57 Cobalt is graphed to insure ±5% of the true activity determined by decay.

2. Relative Response with 137 Cesium
   frequency: daily

   All values recorded and reviewed monthly by clinical supervisor. See enclosed forms.

3. Instrument sensitivity with 137 Cs, 133 Ba, 57 Co, and 60 Co
   frequency: monthly by clinical supervisor

   All values of standards compared to their true activity calculated by decay. All isotopes will be within ±5% except 133 Ba, ±10% in order to pass sensitivity check.

4. Quarterly dose calibrator analysis
   frequency: quarterly by clincial supervisor

   137 Cs used for analysis, values obtained are compared to the original baseline (decayed) or to the previous quarters results (decayed). All reading must be within ±5% to pass analysis. See enclosed form.

5. Linearity
   frequency: quarterly

   Calculated by consultant physicist

6. Geometric variation

   Is on record and will be repeated following instrument calibration or repair.

7. Instrument accuracy
   frequency: at least quarterly by clinical supervisor

   As part of our quarterly dose calibrator analysis, the 137 Cs, 133 Ba, 57 Co, and 60 Co sources are assayed three times (each). The mean value is calculated and compared to the true activity determined by decay. Results must be ±5% for all standards except 133 Ba which is allowed ±10%.

Source	Manufacture	Activity	Date	Serial Number
57 Co	NEN	10mCi	10/15/82	3921082A-01
137 Cs	Capintec	102uCi	4/28/77	294-228-19
133 Ba	NEN	272uCi	5/1/80	3580580A-37
60 Co	Capintec	96uCi	4/28/77	214-227-14

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Co-57-4.9mCi - 12-12-77
-137-118 C[redacted] 4-26-82

BIO-MED ASSOCIATES, INC.

753 BOULEVARD • KENILWORTH, NEW JERSEY 07033 • (201) 241-5560

DATE	CALIBRATION STANDARD	ELAPSED DAYS t	Decay correct (uCi)	Bckg 0.01	Dose Calibrator (uCi)	% ERROR	COMMENTS

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BIO-MED ASSOCIATES, INC.

753 BOULEVARD • KENILWORTH, NEW JERSEY 07033 • (201) 241-5560

DOSE CALIBRATOR STANDARD SENSITIVITY CHECK

Date	Calibration Standard	Decay Factor	Decay Corrected Activity (uCi)	Background Activity (uCi)	Net Dose Calibrator Assay (uCi)	%Error From Standard	Comme
				—	—		

Radiological Physicist

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BIO-MED ASSOCIATES, INC.

753 BOULEVARD • KENILWORTH, NEW JERSEY 07033 • (201) 241-5560

 Geometrical Variation Test Continued

1cc Syringe

Time of Assay	Volume	Reading	Decay Corrected Reading	Correction Factor
	0.1 ml			
	0.2 ml			
	0.3 ml			
	0.4 ml			
	0.5 ml			
	0.6 ml			
	0.7 ml			
	0.8 ml			
	0.9 ml			
	1.0 ml			

3cc Syringe

Time of Assay	Volume	Reading	Decay Corrected Reading	Correction Factor
	0.1 ml			
	0.5 ml			
	1.0 ml			
	1.5 ml			
	2.0 ml			
	2.5 ml			
	3.0 ml			

Instrument:

Source: Tc-99m

Date:

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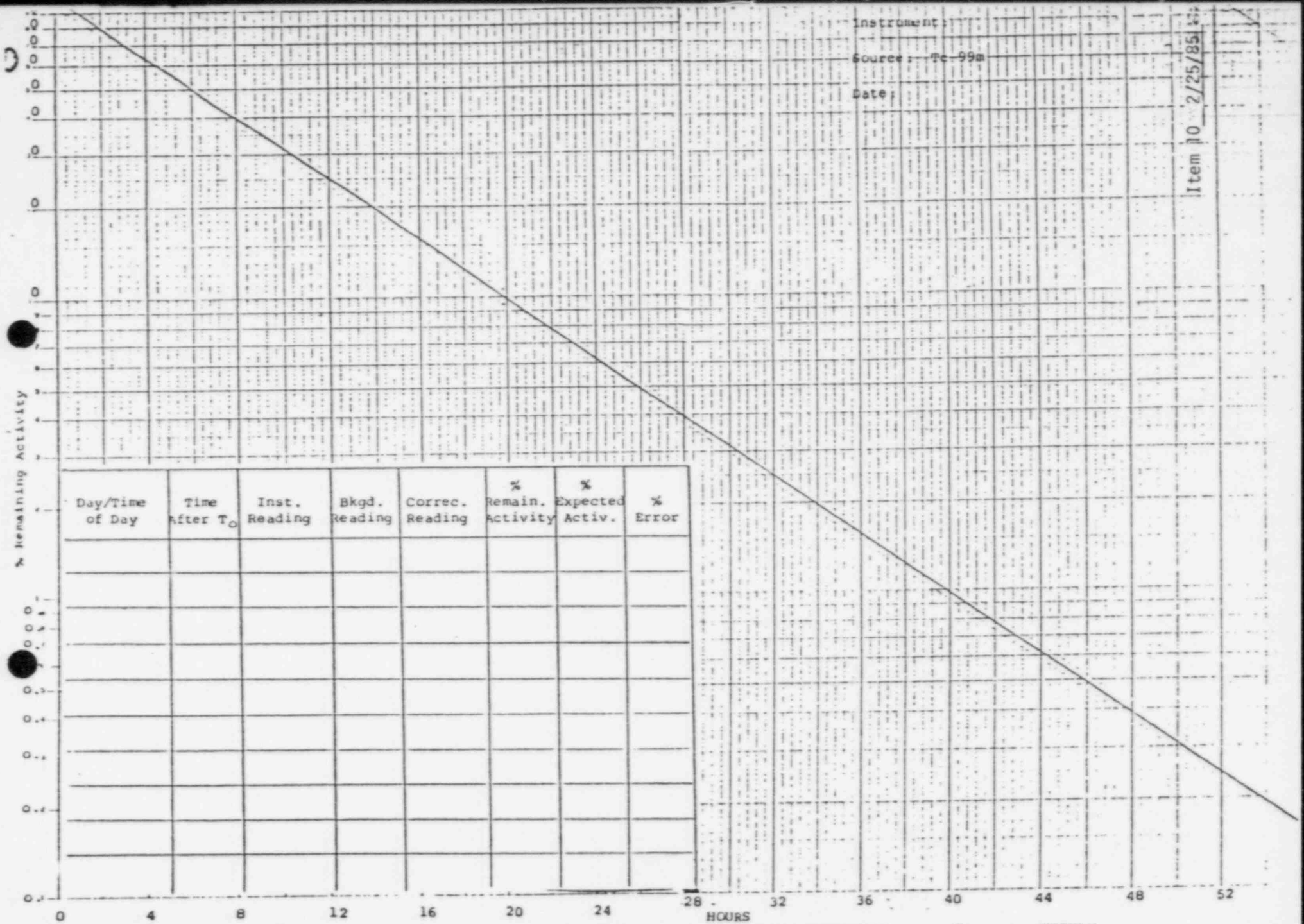

Day/Time of Day	Time After T_o	Inst. Reading	Bkgd. Reading	Correc. Reading	% Remain. Activity	% Expected Activ.	% Error

ELIZABETH GENERAL HOSPITAL

NUCLEAR MEDICINE SURVEY FORM:
REFERENCE DIAGRAM OF NUCLEAR MEDICINE DEPARTMENT ON BACK OF EACH SURVEY FORM.

SURVEYOR:_____DATE:_____

INSTRUMENTATION: GM METER VICTOREEN 491 ( )
D.O.C._____ GM METER T.A. PUG-1 ( )

BACKGROUND: _____MR/HR

WIPE TEST INSTRUMENT: NUCLEAR CHICAGO WELL COUNTER 3037B
SENSITIVITY: _____% EFFICIENCY / SETTINGS: 50-500KEV

STANDARD: CO-57: _____DPM ------_____CPM

[ ]SENSITIVEY CONSISTANT: BCKG_____CPM

SURVEY AREA	MR/HR	CPM	COMMENT	INTS.
1. ENTRANCE/CORRIDOR				
2. L-BLOCK/PREPARATION				
3. DOSE CALIBRATOR				
4. GENERATOR/HOOD				
5. HOT LAB FLOOR/PORT				
6. REFRIGERATOR				
7. CAMERA/FLOOR				
8. COMPUTER/CONSOLES				
9. DESK/PHONE				
10. TECH'S HANDS				

ACTION TAKEN :

* NO ACTION NEEDED LESS THAN OR EQUAL TO BACKGROUND

** RADIATION LEVEL DOCUMENTED, AND STAFF ADVISED, NO OTHER ACTION TAKEN OR NEEDED. LESS THAN TWICE BACKGROUND LEVELS.

*** RADIATION LEVEL RECORDED AND SUPERVISOR INFORMED. DECONTAMINATION PROCEDURES IMPLEMENTED.

SIGNATURE OF SURVEYOR------ _____

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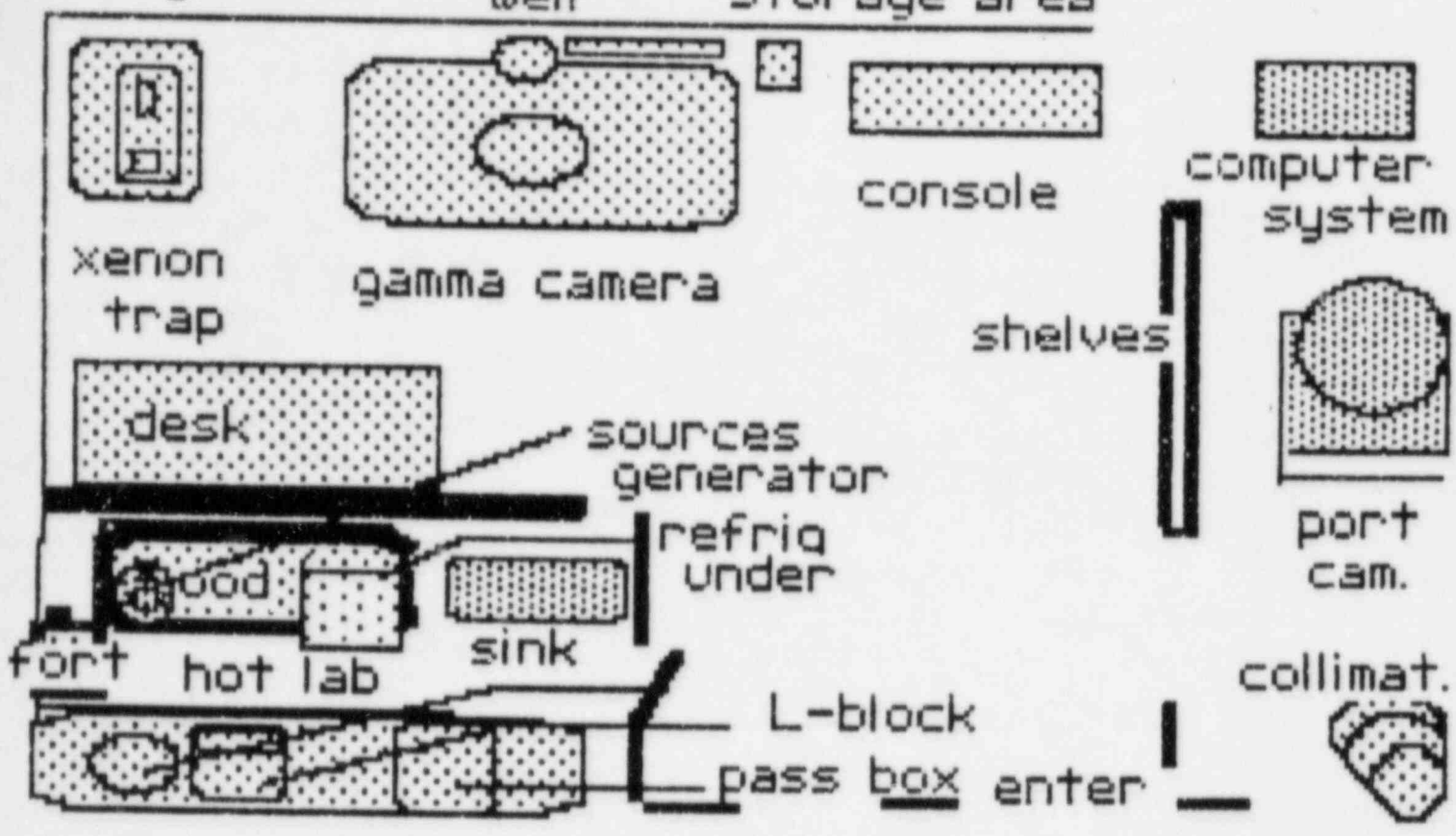
ELIZABETH GENERAL HOSPITAL
NUCLEAR MEDICINE SURVEY FORM



Surveyor: _____

NUCLEAR MEDICINE DAILY SURVEY FORM OF ELUTION, PREPARATION, AND INJECTION AREA.

DATE	ELUTION (GENERATOR)	PREPARATION (L-B)	INJECTION
1____	_____ MR/HR	_____ MR/HR	_____MR/HR
COMENTS: _____			
2.____	_____ MR/HR	_____ MR/HR	_____MR/HR
COMMENTS _____			
3____	_____MR/HR	_____ MR/HR	_____ MR/HR
COMMENTS _____			
4.____	_____MR/HR	_____ MR/HR	_____MR/HR
COMMENTS _____			
5._____	_____MR/HR	_____ MR/HR	_____MR/HR

COMMENTS _____

GM METER: VIC.491 ( ) T.A. PUG-1 ( ) BCKG .05MR/HR( )

The Nuclear Medicine Department is located on the ground floor. It consists of two gamma camera rooms, one hot lab, and a low energy counting area. All isotopes are ordered, stored, and dispensed through the nuclear medicine hot lab.

Please refer to enclosed floor plans.

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The minimum requirement for nuclear medicine technologists at Elizabeth General Hospital is a State Certification in Nuclear Medicine Technology and being a registered technologist with one of the recognized registry organization, i.e., ARRT. All technologists are required to participate in Hospital In-Service Educational Programs. Records are kept documenting at least annual advanced educational programing. The consulting physicist will conduct at least two lectures each year.

THE ELIZABETH GENERAL HOSPITAL AND DISPENSARY

EMERGENCY AREA
RADIOACTIVE SHIPMENT RECEIPT REPORT

1. PURCHASE ORDER # _____ RADIONUCLIDE _____

PUBLIC CARRIER _____ AMOUNT (mCi) _____

VENDOR _____ CHEMICAL FORM _____

DATE RECEIVED _____ TIME _____ RECEIVED BY _____

2. CONDITION OF PACKAGE:

_____O.K. ____PUNCTURED _____STAINS _____WET

_____CRUSHED _____OTHER _____ PACKAGE NOT ACCEPTED

3. RADIATION UNITS ON LABEL: _____mR/hr

4. MEASURED RADIATION LEVELS:

A. 3 FEET FROM SURFACE _____mR/hr

5. PACKAGE DELIVERED TO ___ _____NUCLEAR MEDICINE DEPARTMENT

TIME _____ BY _____

6. WAS TECHNOLOGIST AND COORDINATOR NOTIFICATION REQUIRED?

IF YES, DATE: _____

TIME: _____

PERSONS NOTIFIED: _____

_____

7. INSPECTED BY _____

RADIOLOGY USE ONLY:

WAS NRC AND PUBLIC CARRIER NOTIFICATION REQUIRED? ____YES ____NO

IF YES, DATE: _____

TIME _____

PERSONS NOTIFIED: _____

_____

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The Elizabeth General Hospital

EMERGENCY AREA

Procedure for Accepting and Inspecting
Packages Containing Radioactive Materials

A. Confirmation of Radioactive Materials Shipment.
Verify the identity and amount ordered.
   a. If the radioactive material listed on The Elizabeth General Hospital order sheet coorelates with that on packing slip, proceed with check of condition of package as described in Section B of these procedures.

   b. If the radioactive material listed on The Elizabeth General Hospital order sheet does not correspond with that on packing slip, do not accept package.
      1. Notify depatment to whom package was shipped of non-acceptance.

B. Condition Evaluation of Radioactive Materials Shipment.
Verify if package condition is acceptable.
   a. If punctured, wet, crushed, stained or other visible indication of damage, do not accept package.
      1. Notify department to whom package was shipped of non-acceptance.

   b. If condition is okay, accept package.
      1. Put disposable latex gloves on hands and place package in the lock box located in Nuclear Medicine. Remove gloves and place them on package, lock door and notify radiology technician on call, telephone no. 8196, to remove package from emergency area.

C. Radiation Level Determination, at 3 Feet from Surface of Package Containing Radioactive Materials.
The radiology technician shall determine radiation levels with a thin end-window Geiger Mueller survey meter.
   a. If radiation levels are greater than 10 mR/hr, leave package in storage closet.
      1. Notify department, to whom package was shipped, of high levels.
      2. Department to whom package was shipped shall notify public carrier, that delivered package, and the NRC Regional Office of Inspection and Enforcement.

   b. If radiation levels are less than 10 mR/hr, the radiology technician shall place disposable latex gloves on hands and proceed to deliver package to "Hot" Laboratory in Nuclear Medicine Department. The radiology technician's gloves and those carried over from the Emergency Department are to be discarded into commercial disposal waste container.

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D. DURING OFF DUTY HOURS (DAILY BETWEEN 4:00 PM AND 7:00 AM AND ALL DAY SATURDAY AND SUNDAY), ALL PACKAGES CONTAINING RADIOACTIVE MATERIAL SHALL BE SIGNED FOR BY SECURITY PERSONNEL. THE PACKAGE SHALL BE LOCKED IN THE "LOCK BOX" OUTSIDE NUCLEAR MEDICINE. THEY KEY TO THE OUTSIDE DOOR OF THE "LOCK BOX" SHALL BE KEPT ONLY BY AUTHORIZED SECURITY PERSONNEL. THE KEY TO THE INSIDE DOOR OF THE "LOCK BOX" SHALL BE KEPT ONLY BY AUTHORIZED NUCLEAR MEDICINE STAFF.

E. ALL PACKAGES TO BE RETURNED TO PHARMACEUTICAL SUPPLIERS, THAT CONTAIN RADIOACTIVE MATERIALS SHALL BE LOCKED IN THE "LOCK BOX" BY NUCLEAR MEDICINE STAFF. SECURITY PERSONNEL SHALL OPEN THE "LOCK BOX" WHEN THE PICK UP IS MADE.

ELIZABETH GENERAL HOSPITAL - DIVISION OF NUCLEAR MEDICINE

MATERIALS RECEIVED

DATE RECEIVED	RECEIVED BY	MATERIAL RECEIVED	QUANTITY	RADIOACTIVE OR NON-RADIOACTIVE	PACKING SLIP ENCLOSED? YES	PACKING SLIP ENCLOSED? NO	PACKING SLIP PROCESSED? YES	PACKING SLIP PROCESSED? NO
								●
								●

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THE ELIZABETH GENERAL HOSPITAL

EMERGENCY AREA

RADIOACTIVE SHIPMENT RECEIPT REPORT

1. Purchase Order #_____ Radionuclide_____

   Public Carrier_____ Amount (mCi)_____

   Vendor _____ Chemical Form_____

Date Received_____ Time_____ Received By_____

2. Condition of Package:

   _____O.K. _____Punctured_____ Stains_____Wet

   _____Crushed_____Other_____Package Not Accepted

3. Radiation Units on Label:_____mR/hr.

4. Measured Radiation Levels:

   a. 3 feet from surface_____mR/hr.

5. Package delivered to_____Nuclear Medicine Department

   _____Pathology. Time_____

6. Was NRC and Public Carrier Notification required_____Yes_____No

   If yes, Date:
   Time:
   Persons Notified:

Item 13 2/25/85

The Elizabeth General Hospital

Nuclear Medicine Department

Procedure for Safely Opening Packages
Containing Radioactive Materials

1. Plastic gloves and lab coat must be worn for opening package, for the protection of the surveyor.

2. Place package behind radiation shield, on a surface with absorbent material. Treat package as contaminated until proven otherwise.

3. Radiation levels at the surface and at 3 feet from the surface of the package must be determined within:
   a. 3 hours if received during normal work hours.
   b. 12 hours if received after normal work hours.

4. Measure exposure rate, with thin-window type Geiger Mueller survey meter, at 3 feet from package surface and record results.
   a. If greater than 10 mR/hr, proceed with caution. Notify public carrier that delivered package and NRC Regional Office of Inspection and Enforcement.
   b. If less than 10 mR/hr, proceed to Section 6 of these procedures.

5. Measure exposure rate, wtih ionization-type survey meter, at surface and record results.
   a. If greater than 200 mR/hr, proceed with caution. Notify carrier that delivered package and NRC Regional Officer of Inspection and Enforcement.
   b. If less than 200 mR/hr, proceed to Section 6 of these procedures.

6. Observe and record condition of package.
   a. If package is punctured, wet, crushed or stained, perform a wipe of concerned area:
      1. For high energy beta emitters, determine extent of contamination with thin end-window Geiger Mueller counter, and record results.
      2. For pure gamma emitters, determine extent of contamination with a gamma-scintillation counter, and record results.
   b. If activity of wipe is greater than 0.01 uCi (22,000 D.P.M.) proceed with caution. Notify public carrier that delivered package and NRC Regional Office of Inspection and Enforcement.
   c. If activity of wipe is less than 0.01 uCi, proceed to Section 7 of these procedures.

7. Open package to verify contents.
   a. Determine whether radioactive material listed on requisition packing slip corresponds with that on label of bottle.
   b. Inspect final source container to ascertain whether seal or bottle has been damaged.
   c. Check that shipment does not exceed possession limits.

Item 14 2/25/85

ELIZABETH GENERAL
MEDICAL CENTER

925 EAST JERSEY STREET / ELIZABETH, NEW JERSEY 07201 • (201) 289-8600
DEPARTMENT OF RADIOLOGY • (201) 558-8054

Our Second Century of Caring

SUBJECT: SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS

DATE: JANUARY 18, 1984

POLICY NO: 4 - N.M.

POLICY

CONSIDERING THE POSSIBILITY THAT PACKAGES CONTAINING RADIOACTIVE SHIPMENTS TO THE DIVISION OF NUCLEAR MEDICINE MAY BE CONTAMINATED, A DETAILED PROCEDURE IS REQUIRED INDICATING THE SAFE METHOD OF OPENING AND HANDLING SUCH PACKAGES.

LORRAINE GREINER, R.T., C.X.T.
COORDINATOR
RADIOLOGIC SERVICES

LG/MLJ

Item 14 2/25/85

ELIZABETH GENERAL MEDICAL CENTER

925 EAST JERSEY STREET / ELIZABETH, NEW JERSEY 07201 • (201) 289-8600

DEPARTMENT OF RADIOLOGY • (201) 558-8054

Our Second Century of Caring

SUBJECT: RECORDING OF MAIERIALS RECEIVED - DIVISION OF NUCLEAR MEDICINE

DATE: JANUARY 5, 1984

POLICY NO: 1 - N.M.

POLICY

THE LARGE VARIETY AND HIGH FREQUENCY OF DELIVERY OF MATERIALS TO THE DIVISION OF NUCLEAR MEDICINE REQUIRES ACCURATE RECORD KEEPING IN ORDER TO:

1) MONITOR AMOUNTS OF INCOMING RECEIVABLES
2) PROVIDE USAGE PATTERNS FOR FUTURE BUDGET PLANNING
3) MAINTAIN CORRECT BILLING AND INVOICE ACCURACY

PROCEDURE

I. IT SHALL BE THE RESPONSIBILITY OF THE DIVISION OF NUCLEAR MEDICINE TO MAINTAIN ACCURATE RECORDS OF ALL MATERIALS RECEIVED.

II. UPON DELIVERY OF ANY MATERIALS TO NUCLEAR MEDICINE, AN ENTRY SHALL BE MADE IN THE NUCLEAR MEDICINE MATERIALS LOG.

A. THIS LOG SHALL BE KEPT WITHIN THE DIVISION OF NUCLEAR MEDICINE.

B. THE FOLLOWING INFORMATION SHALL BE RECORDED:

1. DATE RECEIVED
2. INITIAL OF PERSONNEL RECEIVING AND RECORDING THE MATERIAL
3. INDENTIFICATION OF MATERIAL RECEIVED
4. QUANTITY OF MATERIAL RECEIVED
5. INDICATION IF MATERIAL IS RADIOACTIVE
6. INDICATION OF RECEIPT OF PACKING SLIP
7. INDICATION OF PROCESSING OF PACKING SLIP

III. ONLY AUTHORIZED PERSONNEL SHALL RECEIVE, MONITOR AND RECORD MATERIALS. THE PERSON RECEIVING AND RECORDING MATERIALS SHALL BE RESPONSIBLE FOR PROCESSING THE PACKING SLIPS.

Item 14

IV. A RADIOACTIVE SHIPMENT RECEIPT REPORT SHALL BE COMPLETED AND ATTACHED TO PACKING SLIPS FOR ALL RADIOACTIVE MATERIALS.

V. ALL PACKING SLIPS AND RECEIPT REPORTS SHALL BE SUBMITTED TO THE SECRETARY OF THE COORDINATOR OF RADIOLOGIC SERVICES.

A. THE SECRETARY OF THE COORDINATOR SHALL FORWARD THE ORGINAL PACKING SLIP TO THE PURCHASING DEPARTMENT.
B. A DUPLICATE COPY OF ALL PACKING SLIPS AND ALL RECEIPT REPORTS IN THE NUCLEAR MEDICINE DELIVERIES LOG SHALL BE KEPT ON FILE.

VI. THE CLINICAL SUPERVISOR OF NUCLEAR MEDICINE SHALL BE RESPONSIBLE FOR CHECKING AND MAINTAINING THE ACCURACY OF ALL RECORDS OF MATERIALS RECEIVED.

NOTE: THE ATTACHED SAMPLES OF:

1. THE NUCLEAR MEDICINE MATERIALS RECEIVED LOG
2. RADIOACTIVE SHIPMENT RECEIPT REPORT

THANK YOU FOR YOUR COOPERATION.

LORRAINE GREINER, R.T., C.X.T.
COORDINATOR
RADIOLOGIC SERVICES

LG/MLJ

Item 14
2/25/85

LABORATORY RULES FOR THE USE OF RADIOACTIVE MATERIAL

1. Wear laboratory coats, or other protective clothing at all times in areas where radioactive materials are used.
2. Wear disposable gloves at all times while handling radioactive materials.
3. Monitor hands, feet, and clothing for contamination after each generator elution and radiopharmaceutical kit preparation, and after each dose preparation/administration or before leaving the area with the GM Survey Meter. Log the meter readings.
4. Use syringe shields for preparation of patient doses and administation to patients except in circumstances, such as pediatric cases, where their use would compromise the patient's well-being.
5. Do not eat, drink, smoke or apply cosmetics in any area where radioactive material is stored or used.
6. Assay each patient dose in the dose calibrator prior to administration. Do not use any doses that differ from the prescribed dose by more than 10%.
7. Wear personnel monitoring devices (Film badge or TLD) at all times while in areas where radioactive materials are used or stored. These should be worn at chest or waist level.
8. Wear TLD finger badges during elution of generator and preparation, assay, and injection of radiopharmaceuticals.
9. Dispose of radioactive waste only in specially designated receptacles. Survey receptacles daily to assure exposure levels are less than 2.0 mR/hr. in restricted areas and less than 0.2 mR/hr. in non-restricted areas.
10. Never pipette by mouth.
11. Survey generator, kit preparation, and dose preparation areas after each procedure or at the end of the day with GM Survey Meter, and log readings. If necessary, reposition sources and/or shielding to maintain exposure levels less than 2.0 mR/hr.. Also perform a wipe test for each area listed above and log results. Decontamination procedures are warranted if removable contamination found on any wipe yields a larger than background reading on the GM survey meter with the window open.
12. Confine radioactive solutions in covered containers plainly identified and labelled with name of compound, radionuclide, date, activity, and radiation level if applicable.
13. Always transport radioactive material in shielded containers.
14. Always use disposable coverings (with plastic packing) where radioactive materials in solution are prepared.
15. Always use remote handling tongs when handling or assaying unshielded sources, especially if in quantities greater or equal to patient doses. This is extremely important for the elution of a generator.

Item 15 2/25/85

EMERGENCY PROCEDURES

MINOR SPILLS:

1. NOTIFY: Notify persons in the area that a spill has occurred.

2. PREVENT THE SPREAD: Cover the spill with absorbent paper.

3. REPORT: Report incident to the Radiation Safety Officer.

4. CLEAN UP: Use disposable gloves and remote handling tongs. Carefully fold the absorbent paper and pad. Insert into a plastic bag and dispose of in the radioactive waste container. Include all other contaminated materials such as disposable gloves.

5. SURVEY: With a G.M. Survey Meter, check the area around the spill, your hands and clothing for contamination. Perform a wipe test to assure the absence of removable contamination before resuming normal operations. Log survey and wipe test results and other related information on the incident for laboratory records.

MAJOR SPILLS:

1. CLEAR THE AREA: Notify all persons not involved in the spill to vacate the room.

2. PREVENT THE SPREAD: Cover the spill with absorbent pads, but do not attempt to clean it up. Confine the movement of all personnel potentially contaminated to prevent the spread.

3. SHIELD THE SOURCE: If possible, the spill should be shielded, but only if it can be done without further contamination or without significantly increasing your radiation exposure.

4. CLOSE THE ROOM: Leave the room and lock the door(s) to prevent entry.

5. CALL FOR HELP: Notify the Radiation Safety Officer immediately.

6. PERSONNEL DECONTAMINATION:

   a. Contaminated clothing should be removed and stored for further evaluation by the Radiation Safety Officer.

   b. Rinse the affected area promptly with water.

   c. If contamination covers a large area and a shower is warranted, bring the G.M. Survey Meter and have someone survey the contaminated individual to assure that decontamination is effective.

d. Wash thoroughly with a non-abrasive detergent. Lanoclean is recommended. It contains corn meal that has a mild scrubbing action but does not scratch the skin.

e. Scrub the area thoroughly using detergent and a suitable brush but being careful not to abrade the skin.

f. Continue these procedures until there is not further reduction in the level of contamination, or until the possibility of damage to the skin makes further scrubbing inadvisable.

g. If the level of fixed contamination is more than 5 mR/hr. on a G.M. monitor or there are special circumstances contact the Radiation Safety Officer.

RADIATION SAFETY OFFICER: Robert Silbey, M.D.

OFFICE PHONE: 201-558-8196

HOME PHONE: 201-379-5336

PHYSICIST: Bio-Med Associates

PHONE: 201-241-5560

SURVEY PROCEDURES

A. All elution, kit preparation, and dose preparation areas will be surveyed daily with a G.M. survey meter and decontaminated if necessary as specified in Item 1 "Laboratory Rules for the Use of Radioactive Material", Section II.

B. Laboratory areas where only small quantities of radioactive material are used (less than 200 uCi) will be surveyed monthly.

C. All other nuclear areas will be surveyed weekly by the nuclear medicine staff.

D. The weekly and monthly survey will consist of:

1. A measurement of radiation levels with a survey meter sufficiently sensitive to detect 0.1 mR/hr.

2. A series of wipe tests to measure contamination levels. The method for performing wipe tests will be sufficiently sensitive to detect the contamination limits listed in Section F. (Page 2)

E. A permanent record will be kept of all survey results, including negative results. The record will include:

1. Location, date, and identification of equipment used.

2. Name of person conducting the survey.

3. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc..

4. Measured exposure rates, keyed to location on drawing (point out rates that require corrective action).

5. Detected contamination levels, keyed to locations on drawing.

6. 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.

ELIZABETH GENERAL HOSPITAL

NUCLEAR MEDICINE SURVEY FORM:
REFERENCE DIAGRAM OF NUCLEAR MEDICINE DEPARTMENT ON BACK OF EACH SURVEY FORM.

SURVEYOR:_____DATE:_____

INSTRUMENTATION: GM METER VICTOREEN 491 ( )
D.O.C._____ GM METER T.A. PUG-1 ( )

BACKGROUND: _____MR/HR

WIPE TEST INSTRUMENT: NUCLEAR CHICAGO WELL COUNTER 3037B
SENSITIVITY: _____% EFFICIENCY / SETTINGS: 50-500KEV

STANDARD: CO-57: _____DPM ------_____CPM

[ ]SENSITIVEY CONSISTANT: BCKG_____CPM

SURVEY AREA	MR/HR	CPM	COMMENT	INTS.
1. ENTRANCE/CORRIDOR	_____	_____	_____	
2. L-BLOCK/PREPARATION	_____	_____	_____	
3. DOSE CALIBRATOR	_____	_____	_____	
4. GENERATOR/HOOD	_____	_____	_____	
5. HOT LAB FLOOR/FORT	_____	_____	_____	
6. REFRIGERATOR	_____	_____	_____	
7. CAMERA/FLOOR	_____	_____	_____	
8. COMPUTER/CONSOLES	_____	_____	_____	
9. DESK/PHONE	_____	_____	_____	
10. TECH'S HANDS	_____	_____	_____	

ACTION TAKEN :

* NO ACTION NEEDED LESS THAN OR EQUAL TO BACKGROUND

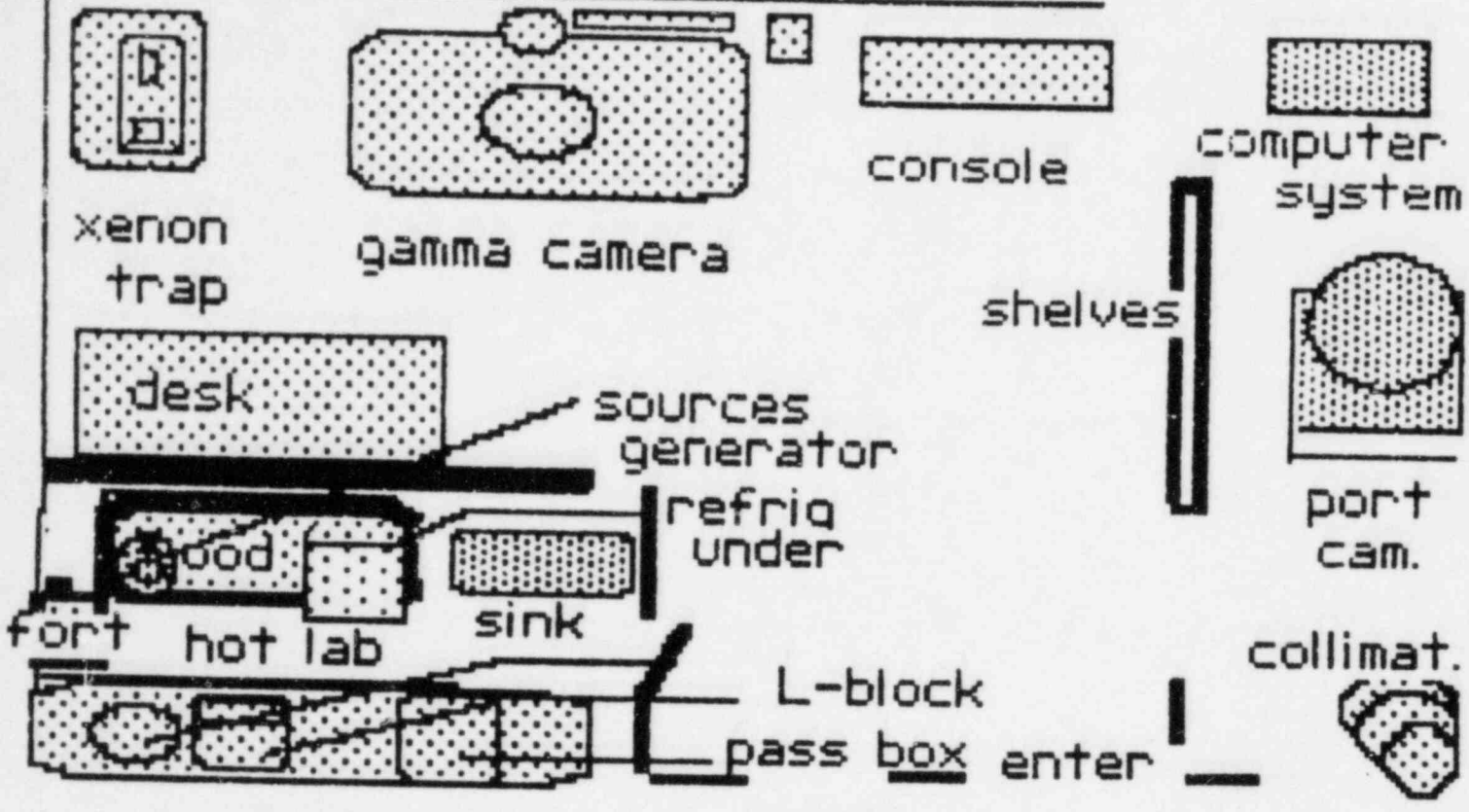
** RADIATION LEVEL DOCUMENTED, AND STAFF ADVISED, NO OTHER ACTION TAKEN OR NEEDED. LESS THAN TWICE BACKGROUND LEVELS.

*** RADIATION LEVEL RECORDED AND SUPERVISOR INFORMED. DECONTAMINATION PROCEDURES IMPLEMENTED.

SIGNATURE OF SURVEYOR------ _____

Item 17 2/25/85

NUCLEAR MEDICINE SURVEY FORM



Surveyor: _____

NUCLEAR MEDICINE DAILY SURVEY FORM OF ELUTION, PREPARATION, AND INJECTION AREA.

DATE	ELUTION (GENERATOR)	PREPARATION (L-B)	INJECTION
1____	_____ MR/HR	_____ MR/HR	_____MR/HR
COMENTS: _____			
2.____	_____ MR/HR	_____ MR/HR	_____MR/HR
COMMENTS _____			
3____	_____MR/HR	_____ MR/HR	_____ MR/HR
COMMENTS _____			
4.____	_____MR/HR	_____ MR/HR	_____MR/HR
COMMENTS _____			
5._____	_____MR/HR	_____ MR/HR	_____MR/HR

COMMENTS _____

GM METER: VIC.491 ( ) T.A. PUG-1 ( ) BCKG .05MR/HR( )

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F. Ideally, any contamination more than a few dpm above background should be cleaned up; however, the following table specifies limits of acceptable levels of contamination for common medical radionuclides:

Type of Surface	I-123 Mo-99	Tc-99m, Co-57; Ga-67; Tl-201;
	dpm/100 cm^2	dpm/100 cm^2
1. Unrestricted Areas	220	2200
2. Restricted Areas	2200	22000
3. Personal Clothing worn outside restricted areas	220	2200
4. Protective Clothing worn only in restricted areas	2200	22000
5. Skin	220	2200

Contamination levels exceeding those listed above warrant establishment of a contamination zone until contamination is removed. For fixed contamination; that which after repeated attempts fails to reduce levels significantly, 5 times the levels listed above in lines 1 and 2 are acceptable without isolation of the area.

Exact contamination on a wipe can be quantized if a NaI well crystal is possessed. Where no NaI well crystal exists the following instrumentation will be employed to assess contamination:

In performing the monthly department surveys the consultant radiation physicist estimates the dpm content of a wipe employing a Co-57 reference source of approximately 1000 dpm, and the NaI crystal detector contained in the Rectilinear Scanner, Thyroid Uptake Probe, or Gamma Camera.

In daily and weekly surveys the nuclear medicine staff assesses the removable contamination extent contained in a wipe by employing a thin end-window G.M. survey meter (with the beta shield removed). Wipes are counted in a low background area, bringing the detector window as close as possible to the wipe. Each wipe will be counted for a minimum of 15 seconds allowing 15 seconds between counts for the meter to equilibrate. A wipe that registers a reading that is larger than background levels will warrant decontamination procedures.

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.

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

_____ Other (specify): _____

_____

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

__X__ 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.**

_____ 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.

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

_____ Other (specify): _____

_____

4. The commercial waste disposal service used will be

Teledyne _____
(Name) (City, State)

NRC/Agreement State License No. 29-00055-14

US Ecology License # WN-1019-2

---

* 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 radioisotopic contaminants. Therefore, the generator columns will be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

Item 18 2/25/85

XENON TRAP EXHAUST MONITORING

DATE	EXHAUST COUNTS/MIN.	BACKGROUND COUNTS/MIN.	A	M.P.C.

Item 21 2/25/85

CURRICULUM VITAE

ROBERT SILBEY, M.D.

HOME ADDRESS: 252 DALE DRIVE
SHORT HILLS, NJ 07078

OFFICE ADDRESS: ELIZABETH GENERAL HOSPITAL
925 E. JERSEY STREET
ELIZABETH, NJ 07201

SOCIAL SECURITY NUMBER: 115-24-7750

BIRTHDATE: JUNE 4, 1930

PLACE OF BIRTH: NEW YORK, NY

MARITAL STATUS: MARRIED 1956 - ESTHER MELTZER SILBEY
CHILDREN: MARK BENNETT, 1957
WILLIAM JAMES, 1959

EDUCATION:

1952 B.A.	COLUMBIA COLLEGE, NEW YORK, NY
1955 M.D.	COLUMBIA UNIVERSITY, COLLEGE OF PHYSICIANS AND SURGEONS. NEW YORK, NY

POSTGRADUATE TRAINING:

1957 - 1960	ASSISTANT RESIDENT AND RESIDENT IN RADIOLOGY, COLUMBIA PRESBYTERIAN MEDICAL CENTER, NY, NY.
1956 - 1957	ASSISTANT RESIDENT IN PATHOLOGY, MT. SINAI HOSPITAL AND MEDICAL CENTER, NY, NY.
1955 - 1956	INTERN (ROTATING) MT. SINAI HOSPITAL, NY, NY.

FACULTY APPOINTMENTS:

1973 - PRESENT	ASSISTANT CLINICAL PROFESSOR OF RADIOLOGY, COLUMBIA UNIVERSITY, COLLEGE OF PHYSICIANS AND SURGEONS
1967 - 1972	ASSISTANT PROFESSOR OF RADIOLOGY, NEW YORK UNIVERSITY MEDICAL CENTER
1960 - 1961	INSTRUCTOR IN RADIOLOGY, COLUMBIA UNIVERSITY, COLLEGE OF PHYSICIANS AND SURGEONS.
1975 - PRESENT	DIRECTOR, SCHOOL OF RADIOLOGIC TECHNOLOGY ELIZABETH GENERAL HOSPITAL/ALEXIAN BROTHERS HOSPITAL

AWARDS, HONORS AND MEMBERSHIP IN HONORARY SOCIETIES:

1951	PHI BETA KAPPA - COLUMBIA COLLEGE
1955	ALPHA OMEGA ALPHA - COLUMBIA UNIVERSITY, COLLEGE OF PHYSICIANS AND SURGEONS
1972 - 1975	MEMBER OF THE NEW JERSEY STATE COMMISSION ON RADIATION PROTECTION
1970 - 1975	MEMBER OF THE BOARD OF MANAGERS, AMERICAN CANCER SOCIETY, UNION COUNTY CHAPTER

HOSPITAL AND ADMINISTRATIVE APPOINTMENTS:

1961 - PRESENT	DIRECTOR OF RADIOLOGY AND ATTENDING RADIOLOGIST, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1960 - 1961	ASSISTANT ATTENDING RADIOLOGIST, COLUMBIA PRESBYTERIAN MEDICAL CENTER
1979 - PRESENT	VICE-PRESIDENT MEDICAL STAFF, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1977 - 1979	SECRETARY - TREASURER MEDICAL STAFF, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1962 - PRESENT	MEMBER OF THE EXECUTIVE COMMITTEE MEDICAL STAFF, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1977 - PRESENT	MEMBER, JOINT CONFERENCE, COMMITTEE OF BOARD OF TRUSTEES AND MEDICAL STAFF, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1978 - PRESENT	CHAIRMAN, CREDENTIAL AND ELIGIBILITY COMMITTEE, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1979 - PRESENT	CHAIRMAN, ELIZABETH GENERAL HOSPITAL/COLUMBIA UNIVERSITY CANCER CENTER SEARCH COMMITTEE
1965 - PRESENT	CHAIRMAN, RADIOISOTOPE COMMITTEE, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1967 - 1970	CHAIRMAN, INTERN/EDUCATION COMMITTEE, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ
1981 - PRESENT	PRESIDENT OF MEDICAL STAFF, E.G.H.

SPECIALTY CERTIFICATION:

1956	NATIONAL BOARD OF MEDICAL EXAMINERS
1961	AMERICAN BOARD OF RADIOLOGY DIPLOMATE IN RADIOLOGY (DIAGNOSTIC AND THERAPEUTIC)

LICENSURE: NEW JERSEY AND NEW YORK

MAJOR TEACHING AND CLINICAL RESPONSIBILITIES:

1. DIRECTOR OF RADIOLOGY SERVICE, ELIZABETH GENERAL HOSPITAL, ELIZABETH, NJ - INCLUDING DIAGNOSTIC RADIOLOGY, NUCLEAR MEDICINE AND ULTRASOUND SECTIONS.
2. ASSISTANT PROFESSOR AT COLUMBIA COLLEGE OF PHYSICIANS AND SURGEONS - INCLUDES MEDICAL STUDENT AND RADIOLOGY RESIDENT INSTRUCTOR.
3. MEDICAL DIRECTOR OF SCHOOL OF RADIOLOGIC TECHNOLOGY OF THE ELIZABETH GENERAL HOSPITAL/ALEXIAN BROTHERS HOSPITAL.
4. DIRECT RADIOLOGIC EDUCATION PROGRAM AT ELIZABETH GENERAL HOSPITAL FOR HOUSE STAFF AND MEDICAL STAFF.

PUBLICATIONS AND LECTURES:

1. SEMINAR ON OVARIAN CANCER - 12/5/79 - SPONSORED BY AMERICAN CANCER SOCIETY - GUEST LECTURER.
2. SEMINAR ON BREAST CANCER - 1973 - SPONSORED BY THE AMERICAN CANCER SOCIETY - GUEST LECTURER ON MAMMOGRAPHY.

PUBLICATIONS AND LECTURES - CONTINUED

3. COFFEY, J. AND SILBEY, R. - REGROWTH OF THE THYMUS AFTER ATROPHY INDUCED BY THE ORAL ADMINISTRATION OF ADRENO-CORTICO STEROIDS TO HUMAN INFANTS. PEDIATRICS 26: 762M 1960.
4. CHODOSH, P., SILBEY, R. AND OEN, K.T. - USE OF ULTRASOUND IN DIFFERENTIAL DIAGNOSIS OF TUMORS OF THE NECK - SUBMITTED FOR PUBLICATION - 1979.

CURRICULUM VITAE

NAME:	KHEE TIANG OEN
BORN:	MAY 30, 1942 IN SURABAJA, INDONESIA
CITIZENSHIP:	NATURALIZED CITIZEN
MARITAL STATUS:	MARRIED WITH 2 CHILDREN
MEDICAL SCHOOL:	UNIVERSITY OF MUENSTER/WEST GERMANY MEDICAL DEGREE IN 1968
INTERNSHIP:	JANUARY 2, 1969 -- MAY 30, 1970 IN LENGERICH HOSPITAL IN WEST GERMANY
	APRIL 1, 1971 -- JUNE 30, 1972 IN WHITE PLAINS HOSPITAL IN WHITE PLAINS, IN NEW YORK
RESIDENCY:	JULY 1, 1972 -- JUNE 30, 1975 RADIOLOGY RESIDENCY IN QUEENS HOSPITAL CENTER LONG ISLAND JEWISH HOSPITAL, QUEENS, NY
FELLOWSHIP:	JULY 1, 1975 -- JUNE 30, 1976 IN EMORY UNIVERSITY, ATLANTA, GA. IN VASCULAR, ULTRASOUND AND C.A.T.
POSITION:	STAFF MEMBER, ELIZABETH GENERAL HOSPITAL JULY 1, 1976 -- PRESENT
BOARDS:	AMERICAN BOARD OF RADIOLOGY -- 1975

CURRICULUM VITAE

JOSEPH P. GREELEY, M.D.
117 GOLF EDGE
WESTFIELD, NEW JERSEY

EDUCATION:

UNIVERSITY OF SCRANTON, SCRANTON, PENNSYLVANIA; 1940-1943, BACHELOR OF ARTS

JEFFERSON MEDICAL COLLEGE; 1947, DOCTOR OF MEDICINE

SCRANTON STATE HOSPITAL; 1947-1948, INTERN

MERCER HOSPITAL, TRENTON, NEW JERSEY; 1948-1950, PATHOLOGY RESIDENCY

PRESBYTERIAN HOSPITAL, PHILADELPHIA, PENNSYLVANIA; 1950, PATHOLOGY RESIDENCY

UNIVERSITY OF PENNSYLVANIA; 1950, DEMONSTRATOR, PATHOLOGY

ARMED FORCES INSTITUTE OF PATHOLOGY, WASHINGTON, D.C.; 1951-1952, PATHOLOGY RESIDENCY

UNITED STATES ARMY; CAPTAIN, MEDICAL CORPS, 1950-1952

HAHNEMANN MEDICAL COLLEGE; 1954, ISOTOPE METHODOLOGY, GRADUATE COURSE

AMA PHYSICIANS RECOGNITION AWARD - VALID UNTIL JUNE, 1985

TEACHING APPOINTMENTS:

NEW JERSEY COLLEGE OF MEDICINE AND DENTISTRY; 1956
ASSISTANT CLINIC PROFESSOR OF PATHOLOGY

PROFESSIONAL ASSOCIATIONS:

AMERICAN MEDICAL ASSOCIATION, MEMBER
AMERICAN COLLEGE OF PATHOLOGISTS, FELLOW
AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS, FELLOW
NEW JERSEY SOCIETY OF PATHOLOGISTS, PRESIDENT, 1966-1968
PHILADELPHIA PATHOLOGY SOCIETY, MEMBER
AMERICAN ASSOCIATION FOR ADVANCEMENT OF SCIENCE, MEMBER
AMERICAN BOARD OF PATHOLOGIC ANATOMY, DIPLOMATE, 1952
AMERICAN BOARD OF CLINICAL PATHOLOGY, DIPLOMATE, 1956
MEDICAL STAFF OF ELIZABETH GENERAL HOSPITAL, SECRETARY-TREASURER, 1956-1962
MEDICAL STAFF OF ELIZABETH GENERAL HOSPITAL, VICE PRESIDENT, 1962-1965
MEDICAL STAFF OF ELIZABETH GENERAL HOSPITAL, PRESIDENT, 1965-1968

PROFESSIONAL APPOINTMENTS:

ELIZABETH GENERAL HOSPITAL; 1953 TO PRESENT, DIRECTOR OF LABORATORIES AND ATTENDING PATHOLOGIST

ELIZABETH GENERAL
MEDICAL CENTER

925 EAST JERSEY STREET / ELIZABETH, NEW JERSEY 07201 • (201) 289-8600
DEPARTMENT OF RADIOLOGY • (201) 558-8054

Our Second Century of Caring

SUBJECT: RECORDING OF MATERIALS RECEIVED - DIVISION OF NUCLEAR MEDICINE

DATE: JANUARY 5, 1984

POLICY NO: 1 - N.M.

POLICY

THE LARGE VARIETY AND HIGH FREQUENCY OF DELIVERY OF MATERIALS TO THE DIVISION OF NUCLEAR MEDICINE REQUIRES ACCURATE RECORD KEEPING IN ORDER TO:

1) MONITOR AMOUNTS OF INCOMING RECEIVABLES
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I. IT SHALL BE THE RESPONSIBILITY OF THE DIVISION OF NUCLEAR MEDICINE TO MAINTAIN ACCURATE RECORDS OF ALL MATERIALS RECEIVED.

II. UPON DELIVERY OF ANY MATERIALS TO NUCLEAR MEDICINE, AN ENTRY SHALL BE MADE IN THE NUCLEAR MEDICINE MATERIALS LOG.

A. THIS LOG SHALL BE KEPT WITHIN THE DIVISION OF NUCLEAR MEDICINE.
B. THE FOLLOWING INFORMATION SHALL BE RECORDED:

1. DATE RECEIVED
2. INITIAL OF PERSONNEL RECEIVING AND RECORDING THE MATERIAL
3. INDENTIFICATION OF MATERIAL RECEIVED
4. QUANTITY OF MATERIAL RECEIVED
5. INDICATION IF MATERIAL IS RADIOACTIVE
6. INDICATION OF RECEIPT OF PACKING SLIP
7. INDICATION OF PROCESSING OF PACKING SLIP

III. ONLY AUTHORIZED PERSONNEL SHALL RECEIVE, MONITOR AND RECORD MATERIALS. THE PERSON RECEIVING AND RECORDING MATERIALS SHALL BE RESPONSIBLE FOR PROCESSING THE PACKING SLIPS.

ELIZABETH GENERAL
MEDICAL CENTER

925 EAST JERSEY STREET / ELIZABETH, NEW JERSEY 07201 • (201) 289-6600
DEPARTMENT OF RADIOLOGY • (201) 558-8054

Our Second Century of Caring

SUBJECT: XENON SYSTEM TRAP EXHAUST MONITORING

DATE: MAY 24, 1984

POLICY NO: 24 - N.M.

POLICY

IN ORDER TO ASSURE THAT THE FILTER TRAP IN THE XENON ADMINISTRATION EQUIPMENT IS PERFORMEING PROPERLY, THE FOLLOWING TEST PROCEDURE WILL BE PERFORMED MONTHLY.

PROCEDURE

1) WHEN PERFORMING AN ACTUAL XENON STUDY, ATTACH THE SPECIALLY PREPARED 30 ML PLASTIC BAG TO THE XENON EXHAUST OUTLET USING AN ADAPTER HOSE.

2) COLLECT THE EXHAUST DURING WASHOUT UNTIL THE BAG IS FULLY INFLATED. BE SURE THAT THE SMALL O_2 INLET TUBE IS PLUGGED OFF.

3) AFTER FULL INFLATION, QUICKLY REMOVE THE BAG AND PLUG THE LARGE INLET TUBE.

4) AFTER THE PATIENT HAS LEFT THE DEPARTMENT, REMOVE THE COLLIMNATOR FROM THE MAXI CAMERA. MAKE SURE THAT THE CAMERA IS PEAKED TO Xe^{133}.

5) RECORD THE BACKGROUND COUNTS FOR ONE MINUTE.

6) PLACE THE PLASTIC BAG ABOVE THE CAMERA HEAD AND RECORD TE BACKGROUND COUNTS FOR ONE MINUTE.

7) PERFORM THE FOLLOWING CALCULATION:

$$M.P.C. = A \times 2.73 \times 10^{-8} \quad /cm^3$$

WHERE

$$A = \text{EXHAUST } \frac{\text{COUNTS}}{\text{MINUTES}} - \text{BACKGROUND } \frac{\text{COUNTS}}{\text{MINUTES}}$$

M.P.C. = THE MAXIMUM PERMISSABLE COUNTS

Item 21
2/25/85

5. $A = \frac{20\ mCi}{patients} \times \frac{5\ patients}{week} \times 1 \times 10^{3}\ \frac{uCi}{mCi} = 1 \times 10^{5}\ \frac{uCi}{wk}$

Assume 20% loss = F = 0.20

$$V = \frac{A \times F}{1 \times 10^{-5}\ uCi/ml} = \frac{1 \times 10^{5}\ uCi/wk \times 0.20}{1 \times 10^{-5}\ uCi/ml}$$

$$\underline{V = 2.0 \times 10^{9}\ ml/wk}$$

The required ventilation is

$$\frac{2.0 \times 10^{9}\ ml/wk}{40\ hr/wk} \times \frac{ft^3/min}{1.7 \times 10^{6} ml/hr} = \underline{30\ ft^3/min}$$

Since the NMR ventilation is 200 cfm we feel that the amount of ^{133}Xenon in Restricted Areas will be below MPC levels.

6. Assume worst case 100% loss of ^{133}Xenon.

$$A = \frac{5\ patients}{wk} \times \frac{20\ mCi}{patient} \times \frac{10^{3}\ uCi}{mCi} \times \frac{52\ weeks}{year}$$

$$\underline{A = 5.2 \times 10^{6}\ uCi/year}$$

$$V = 200\ \frac{ft^3}{min} \times \frac{1.49 \times 10^{10}\ ml/yr}{ft^3/min}$$

$$\underline{V = 3.0 \times 10^{12}\ ml/yr}$$

$$C = \frac{A}{V} = \frac{5.2 \times 10^{6}\ uCi/yr}{3.0 \times 10^{12}\ ml/yr}$$

$$\underline{C = 1.7 \times 10^{-6}\ uCi/ml}$$

The above calculation shows that in an overestimated situation (loss of 100% of 133 Xenon) the air concentrations of Xenon would be less than MPC levels for Unrestricted Areas.

b) Our method of disposal is by absorption of ^{133}Xenon into charcoal traps.

(1) See 6 above. With 100% Xenon loss air concentrations over a one year period would be lower than MPC levels for Unrestricted Areas.

(2) We will monitor the trapping efficiency of the system at least quarterly. A large plastic bag will be secured to the exhaust port of the trap, it will be in place for the entire patient study. The exhaust air (in bag) will be counted for one minute on a Gamma Camera with the collimator removed, on the 133 Xenon photopeak. A log will be kept indicating the background CPM, the exhaust bag CPM, the date, and the signature of the person conducting the test. Trap replacement will be made when the exhaust bag is three times background levels.

1a) (1) 5 patients per week
(2) Average activity per patient 20mCi

b) Desired possession limit is 150mCi

2a) ^{133}Xenon is stored in the Hot Lab in the original lead containers provided by the manufacturer within the Lead Fort. All Xenon is stored inside a ventilation hood, behind lead bricks that are 8" high, 4' wide X 2' in depth.

b) Hot Lab & Camera Room Total supply = 175 cfm
Total exhaust = 200 cfm

Virtually no air is recirculated. Release point of the exhaust vent is located on the roof.

c) Air flow rates will be checked every six months by Medical Center HVAC

3a) All patients are pretested to determine if they can tolerate the procedure prior to actual 133Xenon use. The Xenon is assayed and loaded into the delivery system in the Hot Lab under fume hood. The delivery system (lead shielded) is carried into the camera room for clinical use. The Atomic Products delivery and trap system model 130-500 is inspected for secure hoses prior to use. The outer doors are closed and the mask is secured to the patient. 133Xenon is introduced and the patient is held on the trap until less than 3000 cpm is observed on the Gamma Camera.

b) Atomic Products Model 130-500
Ventilation Hood - Labconco # 47810

4) If ^{133}Xenon contamination is suspected, the emergency procedures are as follows:

a) Evacuate room for 45 minutes
b) Close all doors
c) Notify Radiation Safety Officer
d) Post Do Not Enter signs on outer doors
e) Monitor room with Gamma Camera crystal
f) Have Radiation Safety Officer clear room for reentry.

8) THE M.P.C. SHOULD NOT EXCEED 1×10^{-5} $/ml^3$

9) ENTER THE PERTINENT DATA IN THE APPROPRIATE MONITORING TEST FORM.

LORRAINE GREINER, R.T.
ADMINISTRATOR
RADIOLOGIC SERVICES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

1/3

BETWEEN: William O. Miller, Chief
License Fee Management Branch
Office of Administration

Regional License Section
Material Licensing Branch
FCMS, Office of Nuclear Material
Safety & Safeguards

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED

Applicant/Licensee: Elizabeth General Hospital

Application Dated: 12/26/84

Control No.: 18519

License No.: 29-01600-02

2. FEE ATTACHED

Amount: $580

Check No.: 21477

3. COMMENTS

Signed _____

Date _____

B. LICENSE FEE MANAGEMENT BRANCH

1. Fee Category and Amount: 7C $580

2. Correct Fee Paid. Application may be processed for:

Amendment _____

Renewal ✓

License _____

Signed CAP

Date 1/9/85

sent to RIII
in error
recd back
from RIII 1/28 sent
to RI 1/28