

<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 Expires 9-30-83
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**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  Commander U.S. Darnall Army Community Hospital Fort Hood, TX 76544-5063  TELEPHONE NO.: AREA CODE ( 817 ) 287 - 5988	<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> 1LT Robert L. Syvertson  TELEPHONE NO.: AREA CODE ( 817 ) 287 - 5988	<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. 42-19113-01
<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.) Use will be by or under the supervision of an individual approved by the Radiation Control Committee	<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.)  1LT Robert L. Syvertson

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE					
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	X	10 mCi	IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM	X	100 mCi
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	X	100 mCi
10 CFR 35.100, SCHEDULE A, GROUP II	X	AS NEEDED	PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.	X	100 mCi
10 CFR 35.100, SCHEDULE A, GROUP III	X	6000 mCi	GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
10 CFR 35.100, SCHEDULE A, GROUP IV	X	AS NEEDED	IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA	X	500 mCi
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	X	500 mCi
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
See attached item 6b          <div style="display: flex; justify-content: space-between;"> <span>8512050121 851030 REG4 LIC30 42-19113-01</span> <span>PDR</span> </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: Oct 1980

7. MEDICAL ISOTOPES COMMITTEE		15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL (Check One)	
<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	16. EMERGENCY PROCEDURES (Check One)	
8. TRAINING AND EXPERIENCE			Appendix H Procedures Followed; or
<input checked="" type="checkbox"/>	Supplements A & B Attached for Each Individual User; and	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
<input checked="" type="checkbox"/>	List by Name and Model Number	18. WASTE DISPOSAL (Check One)	
10. CALIBRATION OF INSTRUMENTS		<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	19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS (Check One)	
	Appendix D Procedures Followed for Dose Calibrator; or (Check One)		Appendix K Procedures Followed; or
<input checked="" type="checkbox"/>	Equivalent Procedures Attached	<input checked="" type="checkbox"/>	Equivalent Procedures Attached
11. FACILITIES AND EQUIPMENT		20. THERAPEUTIC USE OF SEALED SOURCES	
<input checked="" type="checkbox"/>	Description and Diagram Attached	NA	Detailed Information Attached; and
12. PERSONNEL TRAINING PROGRAM			Appendix L Procedures Followed; or (Check One)
<input checked="" type="checkbox"/>	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)	
<input checked="" type="checkbox"/>	Detailed Information Attached	<input checked="" type="checkbox"/>	Detailed Information Attached Item 20
14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS (Check One)		22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS	
	Appendix F Procedures Followed; or	NA	Detailed Information Attached
<input checked="" type="checkbox"/>	Equivalent Procedures Attached	23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
		<input checked="" type="checkbox"/>	Detailed Information Attached Item 21

## 24. PERSONNEL MONITORING DEVICES

TYPE <small>(Check appropriate box)</small>		SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY	<input checked="" type="checkbox"/> FILM	Lexington-Bluegrass Army Depot	Monthly
	<input type="checkbox"/> TLD		
	<input type="checkbox"/> OTHER (Specify)		
b. FINGER	<input type="checkbox"/> FILM		
	<input checked="" type="checkbox"/> TLD	Lexington-Bluegrass Army Depot	Monthly
	<input type="checkbox"/> OTHER (Specify)		
c. WRIST	<input checked="" type="checkbox"/> FILM	Lexington-Bluegrass Army Depot	Monthly
	<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		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.

<p>a. LICENSE FEE REQUIRED <i>(See Section 170.31, 10 CFR 170)</i></p>	<p>b. APPLICANT OR CERTIFYING OFFICIAL (Signature)</p> <div style="text-align: center;">               (1) NAME (Type or Print)  <b>COL Richard D. Cameron, M.D.</b>              (2) TITLE  <b>Commander</b> </div>
<p>(1) LICENSE FEE CATEGORY <b>Exempt</b></p>	<p>(3) DATE</p>
<p>(2) LICENSE FEE ENCLOSED \$ <b>NA</b></p>	

## 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.



Radioactive Material Possession Limits

Element and Mass Number	Chemical Form	Maximum Number of mCi of Each Isotope and Form	Purpose of Use
A. Group I Isotopes (except Technetium 99m)	10 CFR 35.100a	5 mCi	uptake, dilution, and excretion
B. Group II Isotopes (except Technetium 99m)	10 CFR 35.100b	20 mCi	diagnostic imaging and localization studies
C. Group III Isotopes (including Technetium 99m)	10 CFR 35.100c	6000 mCi	generators and reagent kits for certain diagnostic studies
D. Group IV Isotopes	10 CFR 35.100d	100 mCi	therapeutic procedures not requiring hospitalization for radiation safety
E. Group V Isotopes	10 CFR 35.100e	500 mCi	therapeutic procedures requiring hospitalization for radiation safety
F. Gold - 195	sealed source	10 mCi	calibration sources

## RADIATION CONTROL COMMITTEE

The responsibilities, duties, and meeting frequency will be as described in Appendix B, NRC Regulatory Guide 10.8. A quorum will consist of five voting members. The membership of the Radiation Control Committee will consist of the following:

a. Voting Members:

Deputy Commander for Clinical Services, Chairman

Cdr, DENTAC

Chief, Department of Medicine

Chief, Department of Nursing

Chief, Department of Radiology

Chief, Nuclear Medicine Service

Chief, Logistics Division

Chief, Department of Surgery

Chief, Pharmacy Service

Chief, Department of Pathology

Radiation Protection Officer

b. Non-Voting Members:

NCOIC, Department of Radiology

NCOIC, Nuclear Medicine Service

ACCEPTABLE TRAINING AND EXPERIENCE FOR  
MEDICAL USES OF BYPRODUCT MATERIAL

The Radiation Control Committee will review the preceptor statements of all physicians prior to their approval to utilize byproduct material. All users of byproduct material at DACH will meet the conditions outlined in Appendix A, NRC Regulatory Guide 10.8. Users who receive training after 1 July 1984, will meet the conditions published by the NRC in the Federal Register, Vol. 47, No. 232, dated Thursday, 2 December 1982.

(8-78)

# TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER

SYVERTSON ROBERT L.

(SEE ATTACHED CURRICULUM VITAE)

2. STATE OR TERRITORY IN  
WHICH LICENSED TO  
PRACTICE MEDICINE

NA

## 3. CERTIFICATION

SPECIALTY BOARD  
ACATEGORY  
BMONTH 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	FRANCIS MARION COLLEGE FLORENCE, S.C. 1978-83	750	250
b. RADIATION PROTECTION	" "	150	75
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	"	1000	12
d. RADIATION BIOLOGY	"	30	15
e. RADIOPHARMACEUTICAL CHEMISTRY	"	30	15

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

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Atomic Numbers 1-82 in millicurie and micro- curie amounts		FRANCIS MARION COLLEGE HYDRO NUCLEAR SERVICES US ARMY ENVIRONMENTAL HYGIENE AGENCY(USAEHA)	1978-1983 1982 1983-1984	RADIATION PROTECTION
Cs-137	130 Curies	USAEHA	1983-1984	"
PuBe	5 millicuries	USAEHA	1983-1984	"
CO-60	2 Curies	FRANCIS MARION COLLEGE	1981-1983	"



CURRICULUM VITAE  
ROBERT L. SYVERTSON  
NUCLEAR MEDICAL SCIENCE OFFICER

HOME ADDRESS: 1702 Sherman Drive, Killeen, TX 76541

DATE OF BIRTH: 31 December 1960

PLACE OF BIRTH: Winchester, Massachusetts

CIVILIAN EDUCATION:

Francis Marion College Florence, SC	Bachelor of Science Health Physics	1983
University of Lowell Lowell, MA	Certification Review for Health Physists	1984
UTHSC-SA San Antonio, TX	Radiation Safety Officers Course	1985

MILITARY EDUCATION:

AMEDD Officer's Basic Fort Sam Houston, TX	9 weeks	1983
NMSO Workshop APG-EA, MD	1 week	1983
AMEDD RPO Workshop APG-EA, MD	1 week	1984
Medical X-Ray Survey Techniques Course Fort Sam Houston, TX	2 weeks	1984
Laser-Microwave Hazards Course APG-EA, MD	1 week	1984
Nuclear Hazards Training Course Kirtland AFB, NM	1 week	1984

Work Experience:

Technical Writer 1982  
Hydro Nuclear Services  
Marlton, NJ

Technical writer, Hydro Nuclear Services, Marlton, NJ. Wrote a six month course in health physics that was designed to provide junior health physics technicians with the knowledge to become competent senior technicians. Also qualified in the use of the company's whole body counting and respirator fit testing systems.

Lab Assistant 1981-1983  
Francis Marion College  
Florence, SC

Lab Assistant, Francis Marion College, Florence, SC. Assisted college professor in conducting laboratory experiments in technical and general physics, modern physics, electronics, nuclear physics, radiation physics, and health physics. Other duties performed included wipe tests, personnel monitoring program, and equipment set-up.

Survey Officer  
U.S. Army Environmental Hygiene Agency 1983-1984  
APG-EA, MD

Survey Officer, USAEHA, APG-EA, MD. Duties included the surveying of radiation protection programs at Army facilities throughout the country. These programs included reactor programs, medical programs, and industrial programs. Additional duties included Alternate Radiation Protection Officer for USAEHA's three NRC licenses and the review of Army facilities' applications for NRC licenses.

Radiation Protection Officer 1984-Present  
U.S. Darnall Army Community Hospital  
Fort Hood, TX

Duties include the management of the radiation protection program established at DACH. This includes work in the Nuclear Medicine Service, the Department of Radiology, and the Preventive Medicine Service.

EXPERIENCE/EDUCATION UTILIZING RADIOISOTOPES:

Radioisotopes

130 Curie Cs-137 source  
50 Curie Cs-137 source  
5 Curie Co-60 source  
3 Curie PuBe source  
2-3 Curie Mo-99 generators

Most other isotopes with atomic numbers 3-83.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

Plenary member, Health Physics Society

## INSTRUMENTATION

### 1. Survey Meters

- a. Manufacturer's name: Victoreen  
Manufacturer's model number: 470A  
Number of instruments available: 1  
Minimum range: 0 mR/hr to 3 mR/hr  
Maximum range: 0 R/hr to 1000 R/hr
- b. Manufacturer's name: Eberline  
Manufacturer's model number: RO-58  
Number of instruments available: 1  
Range: .1 mR/hr to 2000 mR/hr
- c. Manufacturer's name: Picker  
Manufacturer's model number: Lab Monitor  
Number of instruments available: 2  
Minimum range: 0 mR/hr to 300 mR/hr  
Maximum range: 0 mR/hr to 30000 mR/hr
- d. Manufacturer's name: Eberline  
Manufacturer's model number: PRS-1  
Number of instruments available: 4  
Selected ratemeter or scaler functions
- e. Manufacturer's name: Ludlum  
Manufacturer's model number: Model 16  
Number of instruments available: 2 w/high energy probe  
Minimum range: 0 cpm to 500 cpm  
Maximum range: 0 cpm to 50000 cpm
- f. Manufacturer's name: Ludlum  
Manufacturer's model number: Model 16  
Number of instruments available: 2w/low energy probe  
Minimum range: 0 mR/hr to 500 mR/hr  
Maximum range: 0 mR/hr to 500000 mR/hr
- g. Manufacturer's name: Victoreen  
Manufacturer's model number: 493-5  
Number of instruments available: 1  
Minimum range: 0 mR/ to .5 mR/hr  
0 cpm to 3000 cpm  
Maximum range: 0 mR/hr to 50 mR/hr  
0 cpm to 30000 cpm

h. Manufacturer's name: Victoreen  
 Manufacturer's model number: 740-F  
 Number of instruments available: 3  
 Minimum range: 0 mR/hr to 25 mR/hr  
 Maximum range: 0 mR/hr to 25000 mR/hr

i. Manufacturer's name: Picker  
 Manufacturer's model number: 655-186  
 Number of instruments available: 1  
 Minimum range: 0 mR/hr to .20 mR/hr  
 Maximum range: 0 mR/hr to 2000 mR/hr

2. Dose Calibrator

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

3. Instruments used for diagnostic procedures

Gamma Camera	Picker	Dynacamera 415
Gamma Camera	Picker	Dynamo Mobile

4. Other

Type of Instrument	Manufacturer's	Model No.
Automatic well counter	ARIA	HT4
Well counter	Abbott	Autologic
Well counter, dual channel	Picker	PAC-5
Single channel analyzer	Ludlum	2200
Dual channel analyzer	Ludlum	2218
Multichannel analyzer	Canberra	Series 85
Proportional counter	NMC	PC-55
X-Ray monitor	MDH	1015
Xenamatic Gas Delivery System	The Gollman Group	3000
Xenon room air and trap monitor	Victoreen	XenoGuard
Thyrodyn Uptake System	Picker	628102-1
ATOMASTER Scanner	Atomic Products	149-200



## CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items.

- |          |    |  |
|----------|----|--|
| <u>X</u> | 1. | Survey instruments will be calibrated at least annually and following repair.  |
| <u>X</u> | 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 +10 percent of the calculated or known values for each point checked. Readings within +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 +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.
- X c. By a consultant or outside firm
- (1) Name Sacramento Army Depot
- (2) Location Sacramento, California
- (3) Procedures and sources
- X have been approved by NRC and are on file in License No. 4-4279-1
- \_\_\_\_\_ 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.
- \_\_\_\_\_ 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.

## METHODS FOR CALIBRATION OF DOSE CALIBRATOR

The procedures listed in Appendix D, Section 2, Nuclear Regulatory Guide 10.8, will be utilized with the following exceptions:

a. Test for Instrument Constancy. The procedures provided in Appendix D will be followed with the exception that the net activity will not be plotted vs. day of the year. The results will be contained in a consecutive entry log and results will be compared to previous days results for discrepancies and trends.

b. Test of Instrument Linearity. One of the following procedures will be used.

(1) The procedures listed in Appendix D, NRC Regulatory Guide 10.8.

(2) Calicheck TM or equivalent Linearity Check Kit using the manufacturer's instructions.

c. Test for Geometrical Variation. The procedures given in Appendix D will be followed with the exception that the correction factors will not be plotted vs. volume. In place of the graph, a chart will be constructed containing correction factors to be used for the applicable volumes.

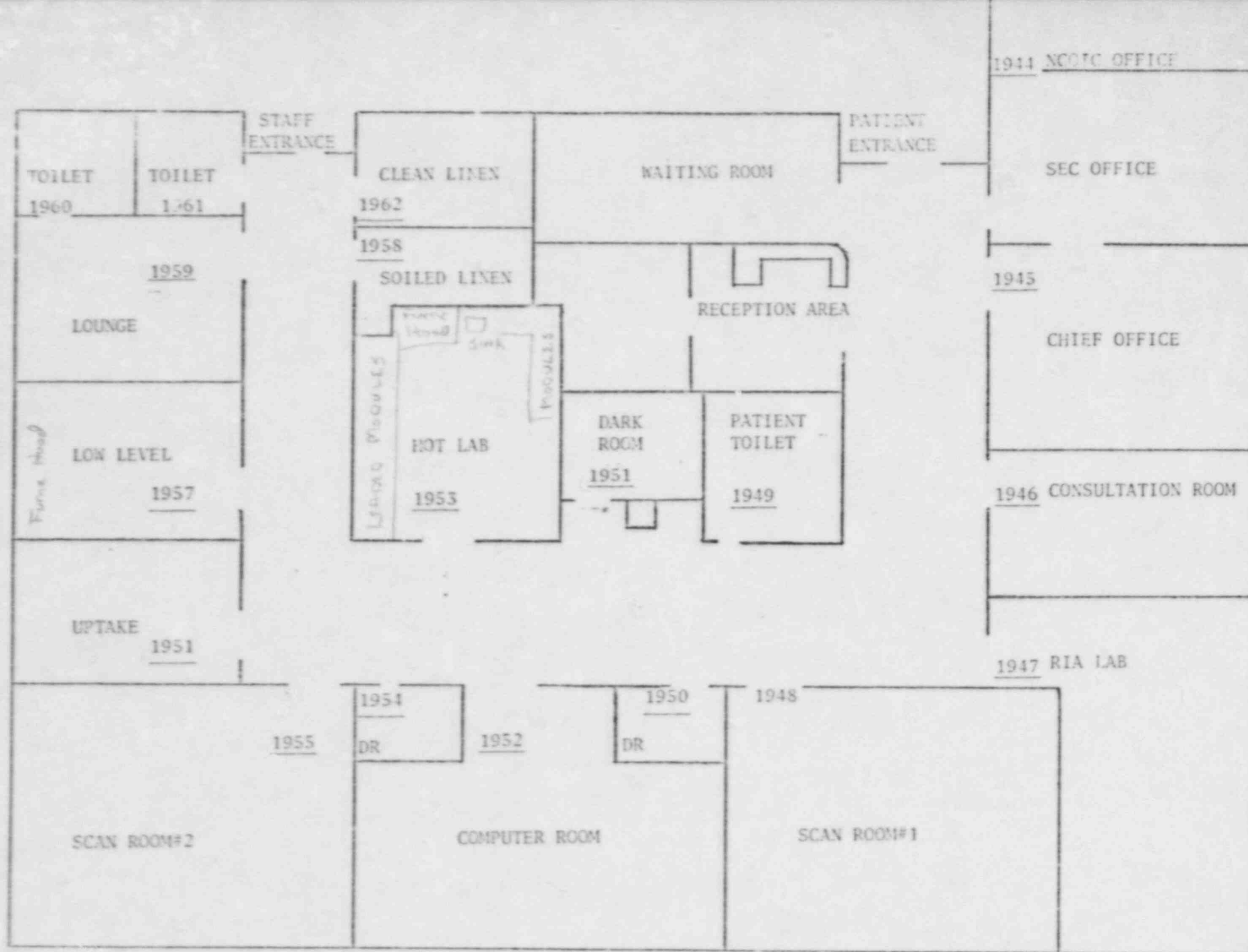
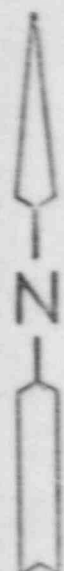
d. Test for Instrument Accuracy. The test for instrument accuracy will be performed by the manufacturer when the instrument is returned for routine calibration or in accordance with Appendix D, Section 2, NRC Regulatory Guide 10.8.

## FACILITIES AND EQUIPMENT

The Hot Lab utilizes Kewaunee Nuclear Medicine Modules. These are leaded modules that are designed to provide protection from radiation sources located in the Nuclear Medicine Hot Lab. The leaded modules contained in the Hot Lab are as follows:

- 1 No. RH-3 Receiving, Holding, and Storage Module
- 1 No. RF-3 Refrigerator Module
- 1 No. IS-3-12 Inventory and Storage Module
- 1 No. EE-3 Enclosure Base Module
- 1 No. SD-3 Sink and Decay Storage Module

Fume hoods are located in the Hot Lab and also in the Low Level room. A diagram of the Nuclear Medicine Clinic is provided.



NUCLEAR MEDICINE DIAGRAM

#### PERSONNEL TRAINING PROGRAM

The personnel training program will be in accordance with 10 CFR 19.12. The topics covered will include those listed in 10 CFR 19.12 and the training will be given annually.



PROCEDURES FOR ORDERING AND ACCEPTING DELIVERY  
OF RADIOACTIVE MATERIAL

The procedures for ordering and accepting delivery of radioactive material will be as stated in Appendix E, NRC Regulatory Guide 10.8, with the exception of the procedures for acceptance of shipments after duty hours. The procedures for acceptance of material after duty hours will be as follows:

1. Upon notification that a shipment of radioactive material has arrived at DACH, the AOD/SDNCO will:

- a. Visually note whether package is wet, damaged or leaking.
- b. If the package is damaged, wet, or leaking, the AOD/SDNCO will:

- (1) Have the carrier place the package(s) on the plastic bag from the spill kit located in the AOD room.

- (2) Request the carrier to wait for the RPO to arrive.

- (3) Immediately notify:

- 1LT Syvertson, RPO - 628-2847/Beeper 750
    - SFC Vincent, NCOIC, Nuc Med - 547-1860/Beeper 225
    - COL Favila, C, Nuc Med - 8-8300/Beeper 216

- (4) Place absorbent paper from spill kit over any noticeable liquid and prevent all traffic through the area.

- (5) Wait for RPO to arrive.

c. If the package is not damaged, wet, or leaking, the AOD/SDNCO will:

- (1) Escort the carrier to the Nuclear Medicine Clinic.

- (2) Unlock the door to the Hot Lab (Room 1953).

- (3) Place the package on top of the counter in the Hot Lab.

- (4) Relock all doors.

- (5) Record receipt of the shipment in the AOD Log.

2. Nuclear Medicine personnel will check on receipt of radioactive material on non-duty days to ensure that the shipment is surveyed within 18 hours.

3. If any problems are encountered during receipt of a shipment of radioactive material, contact the RPO at the previously noted number.

PROCEDURES FOR SAFELY OPENING PACKAGES  
CONTAINING RADIOACTIVE MATERIAL

The regulations given in Section 20.205, 10 CFR Part 20 will be followed in reference to which shipments must be monitored. The procedures given in part 2, Appendix F, NRC Regulatory Guide 10.8, will be followed when opening packages that are in excess of the quantities given in Section 20.205, 10 CFR Part 20.

GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIALS

The procedures given in Appendix G, NRC Regulatory Guide 10.8 will be utilized.

## RADIATION EMERGENCIES

The procedures stated in Appendix H, Nuclear Regulatory Guide 10.8, will be utilized in emergency situations involving radioactive material.

## AREA SURVEY PROCEDURES

The area survey procedures contained in Appendix I, NRC Regulatory Guide 10.8, will be implemented with the exception of the following:

A record will be kept of all survey results until disposition is authorized by the NRC. The record will include:

- a. Location, date, and identification of equipment used, including the serial number and calibration date of the instrument.
- 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 which require corrective action).
- e. Detected contamination levels, keyed to locations on the 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.



WASTE DISPOSAL

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

  X   In the sanitary sewer system in accordance with section 20.303 of 10 CFR Part 20.

       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.

  X   Held for decay until radiation levels, as measured in a low background area with a low-level survey meter and with all shielding material removed, have reached background levels. All radiation labels will be removed or obliterated, and the generators will be disposed of as normal trash. The generator columns will be segregated and monitored separately to ensure background levels are reached before disposal 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).

  X   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 the 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 designated based upon the recommendations of U.S. Army Armament, Munitions, and Chemical Command, Rock Island, Illinois.

## RADIATION SAFETY PROCEDURES FOR THERAPEUTIC USE OF RADIOPHARMACEUTICALS

1. All patients treated with 30 mCi or more of I-131 will be placed in a private room that has a toilet.
2. The patients room will be properly posted or attended in accordance with §20.203 or §20.204 of 10 CFR Part 20.
3. Surveys of the patient's room and surrounding areas will be conducted as soon as practicable after administration of the treatment dose. Exposure rates will be measured at the patient's bedside and 3 feet (or 1 meter) from the patient after administration and at the entrance to the room.
4. The form Nursing Instructions for Patients treated with Phosphorus-32 or Iodine-131 (or a similar form containing all the requested information) will be completed immediately after the administration of the treatment dose and a copy placed in the patient's chart.
5. Radiation levels in unrestricted areas will be maintained less than the limits specified in paragraph 20.105(b) of 10 CFR Part 20.
6. All linens will be surveyed for contamination before being removed from the patient's room and, if necessary, will be held for decay.
7. Disposable plates, cups, eating utensils, tissue, surgical dressings, and other similar waste items will be placed in a specially designated container. The material will be collected by the Radiation Protection Officer or his designee, checked for contamination, and disposed of as normal or radioactive waste as appropriate.
8. Nondisposable items used for these patients will be held in plastic bags in the patient's room and will be checked for contamination by the Radiation Protection Officer or his designee. Items may be returned for normal use, held for decay, or decontaminated, as appropriate.
9. If urine and vomitus from I-131 therapy patients are collected, they will be treated as radioactive waste and stored for decay in the radioactive waste storage area.
10. Before a therapy patient's room is reassigned to another patient, the room will be surveyed for contamination and decontaminated if necessary, and all radioactive waste and waste containers will be removed.
11. Nursing instructions.
  - a. Nurses should spend only that amount of time near the patient required for ordinary nursing care. Special restrictions may be noted on the patient's chart. Call the Radiation Protection Officer or Nuclear Medicine Physician with any questions about the care of these patients. Nursing personnel who attend the patient will wear personnel monitoring devices as advised by the Radiation Protection Officer.
  - b. Visitors will be limited to those 18 years of age or over unless other instructions are noted on the precaution sheet on the patient's chart.

## RADIATION SAFETY PROCEDURES FOR THERAPEUTIC USE OF RADIOPHARMACEUTICALS

c. Patients must remain in bed while visitors are in the room and visitors should remain at least 3 feet from the patient.

d. Patients containing radioactive materials are to be confined to their rooms except for special medical or nursing purposes approved by the Radiation Protection Officer and Nuclear Medicine.

e. No Nurse, visitor, or attendant who is pregnant should be 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 should be asked whether they are pregnant.

f. Attending personnel should wear disposable rubber or plastic gloves when handling urinals, bedpans, or other containers having any materials obtained from the body of the patient. Wash gloves before removing and then wash hands. The gloves should be disposed of in the patient's room in the designated waste container.

g. Disposable items should be used in the care of these patients, whenever possible. These items should be placed in the designated waste container.

h. All clothes and bed linens used by the patients should be placed in the laundry bag provided and should be left in the patient's room to be checked by the Radiation Protection Officer or his designee.

i. All nondisposable items should be placed in a plastic bag and should be left in the patient's room to be checked by the Radiation Protection Officer.

j. Surgical dressings should be changed only as directed by the Nuclear Medicine Physician.

k. For I-131 Patients:

(1) Disposable plates, cups, and eating utensils will be used by patients who are treated with I-131.

(2) In any situation where the patient's room may be contaminated or if radioactive urine and/or feces is spilled during collection, call the Radiation Protection officer or his designee. Meanwhile, handle all contaminated material with disposable gloves and avoid spreading contamination.

(3) Keep all contaminated wastes in plastic bags in the patient's room for disposal by the Radiation Protection Officer or his designee. The same toilet should be used by the patient at all times and it should be well flushed (3 times).

l. If a nurse, attendant, or anyone else knows or suspects that his or her skin or clothing, including shoes, is contaminated immediately notify the Radiation Protection Officer or his designee. This person should remain in an area adjacent to the patient's room and should not walk about the hospital.

RADIATION SAFETY PROCEDURES FOR THERAPEUTIC USE OF RADIOPHARMACEUTICALS

m. If a therapy patient should need emergency surgery or should die, notify the Radiation Protection Officer or Nuclear Medicine Service immediatly.

n. The Radiation Protection Officer or his designee will ensure the room is surveyed for contamination before releasing the room.

12. A Nuclear Medicine Physician will be present during administration and will visit the patient at least once every day during the procedure.

13. The Radiation Protection Officer or his designee will be present during the administration and visit the patient at least twice every day during the procedure.

14. Waste disposal. When contaminated wastes are transported to the waste storage/disposal area, precautions will be taken to minimize external irradiation of personnel.



## PROCEDURES AND PRECAUTIONS FOR THE USE OF RADIOACTIVE GASES

### 1. Quantities to be Utilized:

#### a. Patient Information:

- (1) Maximum of 12 patients per week
- (2) Average quantity of 20 mCi per patient

#### b. The desired possession limit for Xe-133 is 500 mCi.

### 2. Use and Storage:

a. Storage: Xe-133 will be stored in the fume hood located in the Hot Lab. The vial will be kept in the shipping pig. As the Xe-133 is outdated, the vial will be sealed in the shipping pig and held for decay.

b. Use: The Xe-133 will be used primarily in rooms 1948 and 1955.

c. Ventilation rates in rooms 1948, 1953, and 1955 will be checked semi-annually.

d. 100% of the air from rooms 1948, 1953, and 1955 will be exhausted directly to the outside.

e. Currently, the ventilation system in the Nuclear Medicine Service is under modification. Upon completion of the modification, air flow rates will ensure that the concentration of radioactive materials released to unrestricted areas do not exceed any of the applicable standards given in 10 CFR Part 20.

### 3. Procedures for Routine Use:

a. A Pulmonex Xenon System will be used for administration and gas trap collection. The manufacturer's recommended procedures will be utilized.

b. The trap efficiency will be checked utilizing the Victoreen Xenoguard.

c. A log will be kept of the date of the study, the amount of Xenon administered, and the concentration at the exhaust port.

d. A concentration at the exhaust port for 2 scans above the MPC will indicate the need for the charcoal filter to be changed. The used filter will be bagged and held for decay.

e. If an accident occurs in which the MPC is exceeded, the room will be evacuated, the door closed, and entry prohibited until the concentrations in the room reach acceptable levels.



#### USE OF I-131 AND BIOASSAY PROGRAM

A glove box will be utilized whenever the cap is removed from the I-131 liquid. The glove box will be inside the fume hood or connected to the fume hood and personnel performing these procedures will wear appropriate protective apparel. I-131 will be stored in the fume hood in the shipping pig.

The bioassay program established will be in accordance with the recommendations given in NRC Regulatory Guide 8.20.

## RADIATION PROTECTION IODINE THERAPY INSTRUCTIONS

1. VISITORS. Visitors should stay behind the line indicated on the floor of the patient's room at all times. No pregnant women are allowed as visitors. Visitors should be limited to 30 minutes except for those individuals who have been specifically instructed by the Radiation Protection Office (usually the spouse or other next of kin). Visitors shall not use the patient's bathroom. Smoking is not permitted either by the patient or by visitors.
2. NURSING AND PATIENT CARE PERSONNEL. Nursing personnel caring for iodine therapy patients shall wear personnel dosimeters furnished by the Radiation Protection Office while on duty. Other patient care personnel will not normally be assigned dosimeters unless the patient care requires their continued close proximity to the patient. Nursing and patient care personnel should spend as little time as possible near the patient for routine care procedures. Although the patient is usually ambulatory, the patient is confined to his/her room. Any departure, except for emergency reasons, require the approval of the Radiation Protection Office. Excretions and vomitus from the patient are radioactive. If urine or vomitus is spilled, notify the Radiation Protection Office and use rubber gloves and booties during clean-up. Avoid spreading any contamination present. Containers lined with plastic bags will be available for deposit of disposable wastes. Linens will be placed in another plastic bag to be sorted and released by the Radiation Protection Office. Disposable eating utensils, dishes, and trays shall be used throughout the patient's hospitalization. Disposable gloves must be worn when attending the patient or handling items touched by the patient or contaminated material obtained from the body of the patient. No blood or urine samples should be obtained during the first 48 hours unless coordinated with the Radiation Protection Office. Urinals or bed pans used by the patient should not be removed from the room and be flushed several times with hot soapy water after use.
3. HOUSEKEEPING PERSONNEL. Housekeeping personnel should not perform any task in the patient's room until the room has been released by the Radiation Protection Office. The waste from the room is not to be handled by housekeeping personnel.
4. RADIOIODINE THERAPY. Radioiodine therapy involves the oral administration of a solution containing I-131. What is not retained by the thyroid is excreted primarily in the urine and sputum. Consequently, special care must be taken when handling these excretions. Iodine-131 decays with an 8-day half life, therefore the radiation exposure rate will fall off fairly rapidly during the procedure. If the patient should need emergency surgery or should expire, notify the Radiation Protection Office and the Nuclear Medicine Physician immediately.
5. NUCLEAR MEDICINE SUPPORT. Questions concerning medical care of this patient should be directed to the Nuclear Medicine Physician monitoring this case. The Physician monitoring this case is:

Name: \_\_\_\_\_ Office Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

6. Radiation Protection Support. Questions concerning any radiation protection measures related to this patient should be directed to the Radiation Protection Office, 287-5988. The Radiation Protection personnel monitoring this case is:

Name: \_\_\_\_\_ Office Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

RADIATION PROTECTION INSTRUCTIONS CONCERNING PATIENTS UNDERGOING COLLOIDAL PHOSPHORUS-32 THERAPY

1. VISITORS. Visiting is in accordance with usual rules. There are no restrictions related to visitors except that visitors are not allowed to touch or handle patient's surgical dressings or clothing unless authorized to do so by the attending physician or nurse.
2. NURSING AND PATIENT CARE PERSONNEL. Nursing personnel caring for phosphorus-32 therapy cases will not normally be assigned personnel dosimeters due to the minimal external exposure involved. When handling surgical dressings, gloves should be worn. If there is any evidence of leakage from the puncture wound (e.g. stains, dampness, blood), the Nuclear Medicine Physician and the Radiation Protection Office must be notified immediately. All dressings showing evidence of leakage must be assumed to be radioactively contaminated. If such dressings must be removed by nursing personnel, they should be placed in plastic bags for disposal by the Nuclear Medicine Physician or the Radiation Protection Office. If any questions arise concerning contamination of patient linens or clothing, the Radiation Protection Office should be notified so that an evaluation may be made. If there is no drainage from the wound after the first few days, dressings may be handled in the usual manner.
3. HOUSEKEEPING PERSONNEL. Routine housekeeping procedures apply.
4. COLLOIDAL PHOSPHORUS-32 THERAPY. Colloidal Phosphorus-32 therapy involves the injection of a colloidal phosphorus-32 solution into a body cavity. The Phosphorus-32 is a pure beta emitter and does not give rise to a significant external radiation. No special precautions regarding vomitus, urine, or sputum are necessary for patients treated with colloidal phosphorus. The only potential hazard as far as patient care is concerned relates to leakage from the puncture wound on to dressings, linens or clothing. Patients will, however, wear radioactive precaution wrist bands. If the patient should need emergency surgery or should expire, notify the Radiation Protection Office and the Nuclear Medicine Physician immediately.
5. NUCLEAR MEDICINE SUPPORT. Questions concerning medical care of this patient should be directed to the Nuclear Medicine Physician monitoring this case. The Physician monitoring this case is:

Name: \_\_\_\_\_ Office Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

6. Radiation Protection Support. Questions concerning any radiation protection measures related to this patient should be directed to the Radiation Protection Office, 287-5988. The Radiation Protection personnel monitoring this case is:

Name: \_\_\_\_\_ Office Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_