FORM NRC-374C
6-75

U. S. NUCLEAR REGULATORY COMMISSION

MATERIALS LICENSE

Supplementary Sheet

Page 1 of 2 Pages

This Copy Is For Your Files

License Number 13-03284-02

Docket or Reference No.

Amendment No. 32

Reid Memorial Hospital
Department of Radiology
1401 Chester Boulevard
Richmond, Indiana 47374

In accordance with letter dated October 12, 1977, License Number 13-03284-02 is amended as follows:

Subitem 8.F. is amended to read:

8.F. 10 millicuries of each byproduct material authorized in Subitem 6.F.

To add:

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
I. Nickel 63	I. Sealed source (Electron Capture Detector Model 18713A)	I. 15 millicuries

9. Authorized use

I. For use in Hewlett-Packard Model No. 5713A gas chromatograph unit.

Condition 12. is amended to read:

12. Licensed material shall be used by, or under the supervision of, John Spellmeyer, M.D., or John R. Dehner, M.D. Licensed material for diagnostic procedures, Iodine 131, and phosphorus 32 treatment may also be used by, or under the supervision of, John V. Cooke, M.D. Licensed material for diagnostic procedures, Iodine 131, phosphorus 32 and gold 198 treatment may also be used by, or under the supervision of, Richard M. Butler, M.D. Licensed material for Subitems F. and I., may also be used by, or under the supervision of, Olin K. Wiland, M.D.

8506180138 850531
REG3 LIC30
13-03284-02 PDR

For the U. S. Nuclear Regulatory Commission

Date NOV 7 1977

by Radioisotopes Licensing Branch
Division of Materials and Fuel Cycle Facility Licensing
Washington, D. C. 20555

Control No. 01234

License Number 13-03284-02

Docket or
Reference No. ________________

Amendment No. 32

Conditions 18. and 19. are added:

18. Sealed sources containing licensed material shall not be opened or removed from their respective source holders by the licensee.

19. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), Title 10, Code of Federal Regulations, Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.

Date NOV 7 1977

For the U. S. Nuclear Regulatory Commission

by Radioisotopes Licensing Branch
Division of Materials and Fuel Cycle
Facility Licensing
Washington, D. C. 20555

9. INSTRUMENTATION

1. Survey Meters

   a. Manufacturer's name: Eberline Instrument Company
   Manufacturer's model number: E-120G
   Ranges: 0-10, 0-100, 1-1000 mR/hr

   b. Manufacturer's name: Victoreen Instrument Company
   Manufacturer's model number: 389C
   Ranges: 0-0.2, 0-2.0, 0-20 mR/hr

   c. Manufacturer's name: Picker Nuclear Corporation
   Manufacturer's model number: ______
   Ranges: 0-0.5, 0-5.0, 0-50 mR/hr

2. Dose calibrator

   Manufacturer's name: Squibb Company
   Manufacturer's model number: CRC-6A

3. Diagnostic Instruments

Type of Instrument	Manufacturer's Name	Model No.
Gamma Camera	Picker Nuclear Corp.	3C
Uptake Probe	Picker Nuclear Corp.	Spectroscaler 4
Lung Function Unit	Nuclear Associates	

4. Other (monitor)

   Manufacturer's name: Technical Associates
   Manufacturer's model number: PUG 1
   Ranges: 0-500, 0-500, 0-5000 c/m

Item No. 9
January 1, 1979

10. CALIBRATION OF INSTRUMENTS

A. 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 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.

____ 3. Survey instruments will be calibrated

____ a. By the manufacturer

X b. At the licensee's facility

(i) Calibrated source
Manufacturer's name 3M Company
Model no. 6D 6C
Activity in millicuries 27.5
Accuracy ± 5
Traceability to primary standard NBS

(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: James G. Kereiakes, Ph.D.

(ii) Location: University of Cincinnati Medical Center

(iii) Procedures and sources

____ have been approved by NRC and are on file in License No. ________

X are attached

PROCEDURE FOR CALIBRATION OF SURVEY INSTRUMENTS

1. A cesium source (11 mg Radium equivalent - traceable within 5% accuracy to National Bureau of Standards calibrations) is used for calibrations.

2. Frequency of calibration at least annually.

3. Each scale of instrument is calibrated at approximately 1/3 and 2/3 of full scale.

4. Readings of exposure rate measured by instrument shall be within $\pm$ 20% of true exposure rate.

5. Each instrument has a reference check source mounted on instrument. At time of meter calibration, reading is also taken with check source placed at specific geometry relative to detector. Reading of check source is made 1) before each use, 2) after each maintenance and/or battery change, and 3) at least quarterly. If reading is not within $\pm$ 20% of calibration reading, instrument should be recalibrated.

Item No. 10
January 1, 1979

B. Dose Calibrator

1. The following is tested:

   a. Instrument linearity (at installation and annually).
   b. Geometrical variation (at installation).
   c. Instrument accuracy (at installation and annually).

2. After repair or adjustment of the dose calibrator, all of the appropriate tests listed above are repeated.

3. Daily or before each use of the instrument:

   a. The activity of at least two reference sources are measured and recorded (1-2 mCi of Co-57 and approximately 200 μCi of Cs-137). Variation greater than ± 5% in this test indicates the need for instrument repair adjustment or recalibration.

4. Test of Instrument Linearity

   a. Tc-99m vial is assayed in the dose calibrator.
   b. Above repeated at time intervals of 6, 24, 30, and 48 hours after the initial assay.
   c. Using the 30 hour activity measurement as a starting point, the predicted activities at 0, 6, 24, and 48 hours are calculated.
   d. The measured activity for each time interval versus the predicted activity is plotted on log-log graph paper.
   e. The activities plotted should be within ± 5% of the predicted curve if the instrument is linear and functioning properly. Errors greater than ± 5% will indicate the need for repair or adjustment of the instrument.

5. Test for Geometrical Variation

   a. Vial (30 cc containing 2 mCi of Co 57 in a volume of 1 ml) is assayed.
   b. Volume of liquid in the vial is increased in steps to 2, 4, 8, 10, 20 and 25 ml by adding the appropriate amount of water or saline and vial is assayed again.
   c. 20 ml volume is selected as a standard and the ratio of measured activities for each volume to the reference volume activity is calculated. This is used as the volume correction factor.

6. Test For Instrument Accuracy

   The accuracy of the dose calibrator is checked using Cs-137 and Co-57 reference standards whose activity is traceable to NBS.

a. The reference standard is assayed three times in the dose calibrator at the appropriate setting.
b. The average activity determined above should agree with the certified activity of the reference source within ± 5% after decay corrections.
c. A log of these calibration checks is kept.
d. Calibration checks which do not agree within ± 5% indicate that the instrument should be repaired or adjusted.

Calibration of Dose Calibration

A. Sources Used for Linearity Test:

Check as appropriate

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

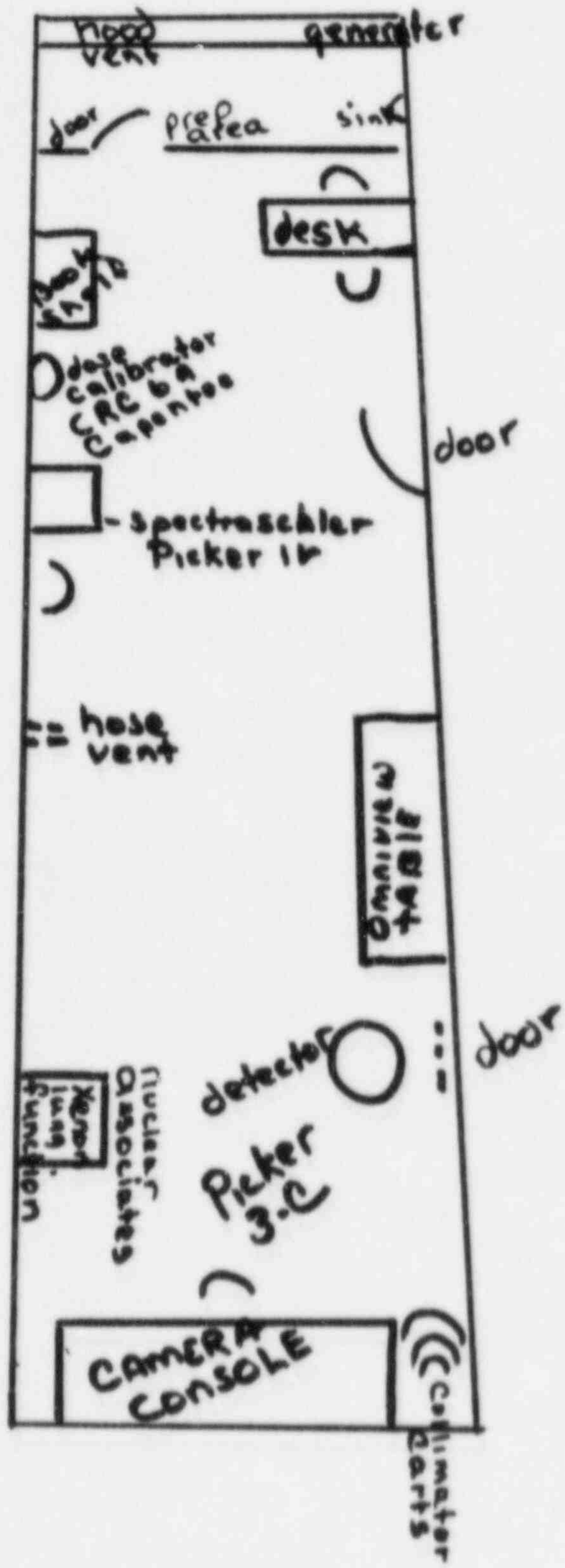
B. Sources Used for Instrument Accuracy and Constancy Tests:

Radionuclide	Activity (mCi)	Accuracy
57 Co	1.44	± 5%
137 Cs	0.21	± 5%

C. The procedures enclosed are used for calibration of the dose calibrator.

Item No. 10
Date: January 1, 1979

11. FACILITIES AND EQUIPMENT



12. PERSONNEL TRAINING PROGRAM AND FREQUENCY

Nuclear medicine technologists receives on-the-job training from staff radiologists (continued post graduate training in X-ray technology including nuclear medicine lectures). Attendance by staff radiologists of national meetings (Radiological Society of North America, American Roentgen Ray Society, etc). Attendance by staff radiologists and nuclear medicine technologist at seminars (i.e., gamma-ray imaging seminar held at University of Indiana Medical Center, Indianapolis, Indiana).

13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL

1. The Chief Nuclear Medicine Technologist places all orders for radioactive material and ensures that the requested materials and quantities are authorized by the license and that possession limits are not exceeded.

2. During normal working hours, carriers with radioactive materials arrive at receiving dock, nuclear medicine laboratory is called. Material is picked up by nuclear medicine technologist within 15-30 minutes.

3. During off-duty hours security personnel accept delivery of radioactive packages in accordance with the enclosed procedures.

MEMORANDUM FOR: Security Personnel

FROM: Administrator

SUBJECT: RECEIPT OF PACKAGES CONTAINING RADIOACTIVE MATERIAL

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

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

Radiation Safety Officer: John. V. Cooke M.D.

OFFICE PHONE: AC 317 962-5152

HOME PHONE: AC 317 962-7294

Item No. 13
January 1, 1979

14. PROCEDURES FOR OPENING PACKAGES CONTAINING RADIOACTIVE MATERIAL

1. Package is inspected for any sign of damage. If damage is noted, Radiation Safety Officer is notified.

2. Exposure rate at 3 feet from package surface is measured and if >10 mR/hr, Radiation Safety Officer is notified.

3. Surface exposure rate is measured and recorded. If >200 mR/hr, Radiation Safety Officer is notified.

4. With gloves on, outer package is opened (following manufacturer's directions, if supplied) and packing slip removed. Inner package is opened to verify contents (comparing requisition, packing slips and label on bottle). Integrity of final source container is checked. Check is also made that shipment does not exceed possession limits.

15. <u>LABORATORY RULES FOR THE USE OF RADIOACTIVE MATERIAL</u>

See enclosed Radiation Safety Manual (p. 1, 2 and 3).

16. EMERGENCY PROCEDURES

See enclosed Radiation Safety Manual (p. 8-11)

Item No. 16
January 1, 1979

17. AREA SURVEY PROCEDURES

A. All elution, preparation and injection areas are surveyed daily with a G-M survey meter and decontaminated if necessary.

B. Laboratory areas where only small quantities of radioactive material are used (less than 100 μCi) are surveyed monthly.

C. All other laboratory areas are surveyed weekly.

D. The weekly and monthly survey consists of:

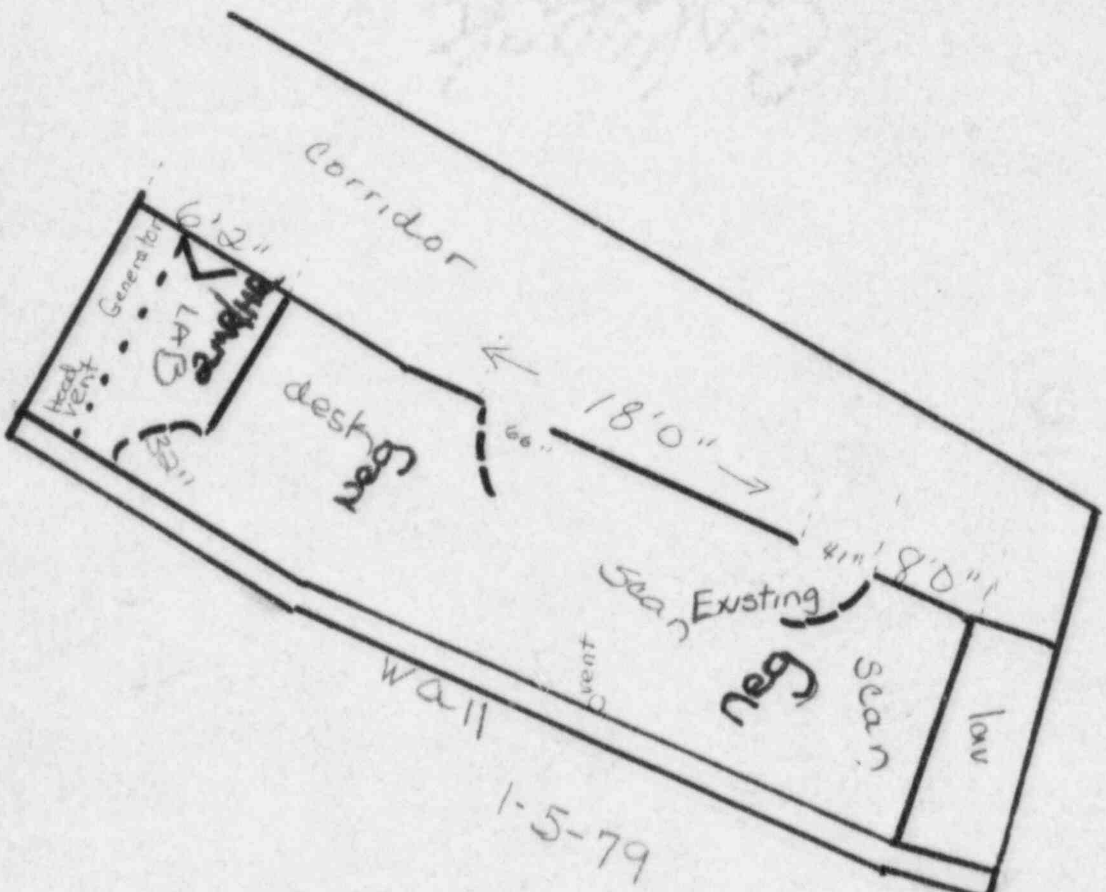
   1. Measurement of radiation levels with a GM survey meter sensitive to detect 0.1 mR/hr.

   2. Series of wipe tests are made to measure contamination levels. The method for performing wipe tests is sufficiently sensitive to detect 100 dpm.

E. A permanent record (see enclosed) is kept of all survey results.

F. Corrective action is taken if the contamination levels exceeds 100 dpm/100 cm^2.

17. [illegible]rea Scematics and Area Survey [illegible]ults



18. WASTE DISPOSAL PROCEDURES

1. Liquid Waste is disposed of

_____ By commercial waste disposal service (see also No. 4 below)

__X__ In the sanitary sewer system in accordance with Section 20.303 of 10 CFR Part 20. (see enclosed)

_____ Other (specify): ______________________________

2. Mo-99/Tc generators is:

__X__ Returned to the manufacturer for disposal (Mallinckrodt)

_____ Held for decay until radiation levels as measured with a low-level survey meter and with all shielding removed, reach background levels. All radiation labels are removed or obliterated and the generators disposed of as normal trash.

_____ Disposed of by commercial waste disposal service (see also No. 4 below)

_____ Other (specify): ______________________________

____

3. Other Solid Waste is:

(Check as appropriate)

__X__ Held for decay until radiation levels (as measured with a low-level survey meter and with all shielding removed) reach background levels. All radiation labels are removed or obliterated and the waste disposed of in normal trash.

_____ Disposed of by commercial waste disposal service

_____ Other (Specify): ______________________________

____

4. The commercial waste disposal service used is: ____________

____

(Name) (City, State)

NRC/Agreement State License No. ____________________

Item No. 18
January 1, 1979

Control No. 0 1 2 3 4

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

Patient's Name:______________________________

Room No.:____________Physician's Name:______________

Radioisotope Administered:______________________

Date and Time of Administration:__________________

Dose Received:____________ Method of Administration:__________

Exposure Rates in mR/hr

Date	3 feet from bed	10 feet from bed

(Comply with all Check Items)

_____1. Visiting time permitted:______________________
_____2. Visitors must remain______________from patient
_____3. Patient may not leave room.
_____4. Visitors under 17 not permitted.
_____5. Pregnant visitors not permitted.
_____6. Film badges must be worn.
_____7. Use and complete the following tags:
     _____door
     _____bed
     _____chart
     _____wrist
_____8. Gloves must be worn while attending patient.
_____9. Patient must use disposable utensils.
____10. All items must remain in room until OK'd by Radiation Safety.
____11. Smoking is not permitted.
____12. Do not release room to admitting until OK'd by Radiation Safety.
____13. Other instructions.

In case of an emergency contact:

RSO John V. Cooke ______________________ AC 317 962-5152 AC 317 962-7294
name   on/off duty telephone no

Item No. 19
January 1, 1979

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

1. All patients treated with iodine-131 or gold-198 are placed in a private room with a toilet.

2. The patient's room is properly posted in accordance with Section 20.203, 10 CFR Part 20.

3. Surveys of the patient's room and surrounding areas are conducted as soon as practicable after administration of the treatment dose. Exposure rates are measured at the patient's bedside, three feet away and the entrance to the room. The Radiation Safety Officer or his designate then determines how long a person may remain at these positions and posts these times in the patient's chart and on his door.

4. The form, Nursing Instructions for Patients Treated with Phosphous-32, Gold-198, or Iodine-131, is completed immediately after administration of the treatment dose. A copy is posted in the patient's chart.

5. Radiation levels in unrestricted areas are maintained less than the limits specified in Section 20.105(b), 10 CFR Part 20.

6. All linens are surveyed for contamination before being removed from the patient's room and are, if necessary, be held for decay.

7. Disposable plates, cups, eating utensils, tissue, surgical dressings, and other similar waste items are placed in a specially designated container. The material is collected daily by the Radiation Safety Officer (or his designate), checked for contamination, and disposed of as normal or radioactive waste, as appropriate.

8. Non-disposable items used for these patients are held in plastic bags in the patient's room, and checked for contamination by the Radiation Safety Officer or his designate. Items are returned for normal use, held for decay or decontaminated, as appropriate.

9. Urine and vomitus, from iodine-131 therapy patients is stored for decay in our radioactive waste storage area. When it reaches background levels as measured with a low-level survey meter, it is released to the sanitary sewer system.

10. Before a therapy patient's room is reassigned to another patient, the room is surveyed for contamination (and decontaminated if necessary) and all radioactive waste and waste containers are removed.

Item No. 19
January 1, 1979

11. Nursing Instructions

a. Nurses spend only that amount of time near the patient required for ordinary nursing care. Special restrictions are noted on the precaution sheet in the patient's chart. Nurses read these instructions before administering to the patients. Nurses are asked to call the Nuclear Medicine Laboratory if they have questions about the care of these patients.

b. Visitors are limited to those 18 years of age or over.

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

d. Radioactive patients are confined to their rooms except for special medical or nursing purposes approved by the Nuclear Medicine Laboratory.

e. No nurse, visitor or attendant who is pregnant is permitted in the room of a patient who has received a therapeutic amount of radioactivity until the patient no longer presents a radiation hazard. Female visitors are asked whether they are pregnant.

f. Attending personnel wear rubber or dispossable plastic gloves when handling urinals, bedpans, emesis basins or other containers having any material obtained from the body of the patient. Gloves are washed before removing and then hands are washed. The gloves are left in the patient's room in the designated waste container.

g. Disposable items are used in the care of these patients, whenever possible. These items are placed in the designated waste container. The Nuclear Medicine Laboratory is contacted for proper disposal of the contents of the designated waste container.

h. All clothes and bed linens used by the patient are placed in the laundry bag provided and left in the patient's room and checked by the Nuclear Medicine Laboratory.

i. All non-disposable items are placed in a plastic bag and left in the patient's room to be checked by the Nuclear Medicine Laboratory.

j. Surgical dressings are changed only as directed by physician. Dressings which indicate leakage of material are collected in plastic bags and turned over to the Nuclear Medicine Laboratory. These dressings are handled only with tongs or tweezers. Disposable gloves are worn.

k. For iodine-131 patients:

(1) Urine from iodine-131 patients is collected in special containers provided by the Nuclear Medicine Laboratory. The patient is encouraged to collect his own urine in the container. If the patient is bedridden, a separate urinal or bedpan is provided. The urinal or bedpan is flushed several times with hot soapy water after use.

(2) If the nurse helps to collect the excreta, she wears disposable gloves. Afterwards she washes her hands with the gloves on and again after the gloves are removed. The gloves are placed in the designated waste container for disposal by the Nuclear Medicine Laboratory.

(3) Disposable plates, cups, and eating utensils are used by patients who are treated with iodine-131.

(4) In case of patient vomiting within 24 hours after oral administration, urinary incontinence, excessive sweating within the first 48 hours, or spilling of urine and/or feces during collection, Nuclear Medicine Laboratory is called, Ext. 5152.

(5) All vomitus is kept in the patient's room for disposal by the Nuclear Meeicine Laboratory. The same toilet is used by the patient at all times and it is well flushed.

l. Precautions are taken to see that no urine or vomitus is spilled on the floor or the bed. If any part of the patient's room is suspected to be contaminated, the Nuclear Medicine Laboratory is notified.

m. If a nurse, attendant or anyone else knows or suspects that his skin, or clothing, including shoes, is contaminated, the Nuclear Medicine Laboratory is immediately notified. This person remains in the patient's room. If the hands become contaminated, they are immediately washed with soap and water.

n. If a therapy patient needs emergency surgery or dies, the Nuclear Medicine Laboratory is notified immediately.

o. When the patient is discharged, the Nuclear Medicine Laboratory is called and requested to survey room for contamination before room is made up.

NURSING INSTRUCTIONS FOR PATIENTS TREATED WITH BRACHYTHERAPY SOURCES

Patient's Name: ______________________________

Room Number: ______________ Physician's Name: ______________

Isotope Activity: ______________________________

Date and Time of Administration: ______________________________

Date and Time Sources are to be removed: ______________ Isotope ______________

Exposure Rates in mR/hr

Bedside	3 feet from bed	10 feet from bed

(Complete checked items)

_____1. Wear film badge.

_____2. Wear rubber gloves.

_____3. Place laundry in linen bag and save.

_____4. Housekeeping may not enter the room.

_____5. Patient may not have visitors.

_____6. No pregnant visitors.

_____7. No visitors under 18 years of age.

_____8. A dismissal survey must be performed before patient is discharged.

_____9. Patient must have a private room

____10. Other instructions.

RSO John V. Cooke, AC 317 962-5152 / AC 317 962-7294
name — on duty/off duty telephone number

Item No. 20
January 1, 1979

20. PROCEDURES FOR USE OF GROUP VI SOURCES FOR TREATMENT OF PATIENTS

1. All patients treated with brachytherapy sources are placed in a private room with toilet.

2. The patient's room is properly posted in accordance with Section 20.203, 10 CFR Part 20.

3. Surveys of the patient's room and surrounding areas are conducted as soon as practicable after sources are implanted. Exposure rate measurements are taken at the patient's bedside, three feet away and at the entrance to the room. The Radiation Safety Officer or his designate then determines how long a person may remain at these positions and posts these times in the patient's chart.

4. The form, Nursing instructions for Patients Treated with Brachytherapy Sources, is completed immediately after sources are implanted and placed in the patient's chart.

5. Radiation levels in unrestricted area are maintained less than the limits specified in Section 20.105(b), 10 CFR Part 20.

6. Nurses caring for brachytherapy patients is assigned film badges.

7. At the conclusion of treatment, a survey is performed to ensure that all sources have been removed from the patient and that no sources remain in the patient's room or any other area occupied by the patient. At the same time all radiation signs are removed and all film and TLD badges assigned to nurses are collected.

8. Instructions to Nurses

   a. Special restrictions are noted on the precaution sheet in the patient's chart. Nurses read these instructions before administering to the patient. The Nuclear Medicine Laboratory is called if nurses have any questions about the care of these patients.

   b. Nurses spend only the minimum necessary time near a patient for routine nursing care, but obtain and wear a film badge.

   c. When a nurse receives an assignment to a therapy patient, a film or TLD badge is obtained immediately from the Nuclear Medicine Laboratory. The badge is worn only by the nurse to whom it is issued.

   d. Pregnant nurses are not assigned to the personal care of these patients.

e. Nurses are instructed that if a source appears dislodged, the Nuclear Medicine Laboratory should be notified at once.

f. Bed bath given by the nurse is omitted while the sources are in place.

g. Perineal care is not given during gynecologic treatment; the perineal pad is changed when necessary, unless orders to the contrary have been written.

h. Surgical dressings and bandages used to cover the area of needle insertion are changed only by the attending physician or radiologist, and ARE NOT DISCARDED until directed by the radiologist. Dressings are kept in a basin until checked by the radiologist or member of the Nuclear Medicine Laboratory.

Special ordera are written for oral hygiene for patients with oral implants.

i. No special precautions are given for sputum, urine, vomitus, stools, dishes, instruments, utensils or bedding unless specifically ordered.

j. These patients stay in bed unless orders to the contrary are written.

k. Visitors are limited to those 18 years of age or over.

l. Visitors sit at least three feet from the patient and remain no longer than the times specified on the form posted on the patient's door and in his chart.

m. No nurse, visitor or attendant who is pregnant is permitted in the room of a patient while brachytherapy sources are implanted in the patient. Female visitors are asked whether they are pregnant.

n. Emergency Procedures

(1) If an implanted source becomes loose or separated from the patient, or

(2) If the patient dies, or

(3) If the patient requires emergency surgery, immediately call the Radiation Safety Officer

John V. Cooke M.D.

AC 317 962-5152 (day)

AC 317 962-7294 (night)

Item No. 20
January 1, 1979

o. At the conclusion of treatment, the Radiation Safety Officer is called and patient room is surveyed to make sure all radioactive sources have been removed.

21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g. Xenon-133)