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Part II

AEC INVESTIGATION OF IODINE-131 MISADMINISTRATION
AT THE
MEDICAL DIVISION, OAK RIDGE ASSOCIATED UNIVERSITIES
(Conclusions and Recommendations of Investigating Committee)

September 4, 1973

REPOSITORY _____
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Introduction and Summary

On September 4, 1973, two female patients inadvertently received 284 microcuries of iodine-131 for thyroid uptake and scan studies at the Medical Division, Oak Ridge Associated Universities. This dose of iodine-131 is approximately ten times the currently used dose (30 microcuries) for thyroid studies at ORAU. The misadministration was discovered on September 5, and the patients and their private physicians were informed of the occurrence on September 6. The ORAU physician advised the patients that the radiation received from this dose does not pose any risk of demonstrable injury or illness. The misadministration resulted from an arithmetic error made by a technician in calculating the volumes of the liquid doses. The patients were referred to the Medical Division, ORAU, by the Oak Ridge Hospital of the Methodist Church (ORHMC), with which the ORAU has cooperative arrangements to provide nuclear medical services.

Following a preliminary investigation of the facts, the Assistant Manager for Operations, Oak Ridge Operations Office, appointed a committee to conduct a formal investigation of the incident. A copy of the appointment letter is given in Appendix 1 of this report.

This section of the investigation report contains the biographical, medical and dosimetry data for the patients, and contains the conclusions and recommendations of the committee. For chronology of events and findings of fact, the reader is referred to Part I of this report.

Biographical Data

Patient One: Name:
Age:
Sex: Female
Occupation: Housewife
Private Physician: David W. Seay, M.D.

Patient Two: Name:
Age:
Sex: Female
Occupation: Housewife
Private Physician: Richard A. Dew, M.D.

Medical Aspects

Two female patients were referred to MD-ORAU by the ORHMC for routine thyroid uptake and scan studies to aid in the clinical evaluation of their enlarged thyroid glands. Both patients inadvertently received larger doses of iodine-131 than were prescribed.

The opinion of the MD-ORAU physician is quoted as follows: "The radiation received by the patients from these doses poses no risk of injury or remote illness." The patients were so informed.

Patient One was given a dose of Lugol's solution following the 48-hour uptake count to suppress subsequent uptake of iodine-131 by the thyroid. Similar prophylactic treatment for Patient Two was not given because of her very low uptake of iodine-131 by the thyroid, i.e., two percent. Prophylactic treatment at 4 hours past administration of the iodine-131 would have reduced the uptake of radioiodine by approximately 50% in normal uptake profiles. This benefit might have applied in the case of Patient One but not for Patient Two.

The MD-ORAU physician stated that he would not have prescribed any prophylactic treatment for the patients prior to completion of the uptake and scan studies, to minimize the radiation exposure to the thyroids, even if the misadministration had been discovered at the time of the 4-hour uptake count. Some reasons for this opinion are.

1. The additional radiation in this case was considered to be insignificant.
2. Early prophylactic treatment would have precluded completion of the thyroid function tests, and the clinical information for which the tests were being performed would have been lost.

For comparison, doses of iodine-131 commonly used for treatment of hyperthyroidism range from 5,000 to 10,000 microcuries or higher. Accordingly, the misadministered dose in this case (284 microcuries) represents only 3-5% of the minimal therapy dose of iodine-131. Therapeutic doses for more serious conditions may range up to 200,000 microcuries.

Dosimetry

The ORAU Medical physicist calculated that Patients One and Two received the following radiation exposure due to the oral administration of 284 microcuries of iodine-131. Patient One had a 28% uptake by the thyroid gland based on the radiation uptake count at 24 hours post-administration. Estimated mass of the Patient One thyroid was 40 grams.

Patient Two, whose thyroid was estimated at 25 grams, revealed a two percent uptake at 24 hours; however, the scan indicated that essentially all the radioactivity was concentrated in about 10% of the gland.

Table 1 summarizes the exposures estimated for critical organs and the total body. ICRP Standard man recommendations for iodine-131 elimination rates from thyroid and the remainder of the body have been used in the dose estimate since measurements on the patients after 48 hours were not made. Due to the thyroid abnormalities exhibited in the scan for Patient Two, the functioning thyroid tissue dose is probably overestimated. Non-functioning thyroid tissue is estimated to have received about 2 rad.

TABLE 1

<u>Patient</u>	<u>Radiations Dose - Rad</u>		
	<u>Total Body</u>	<u>Thyroid</u>	<u>Ovaries</u>
One	0.240	240	0.160
Two	0.050	280	0.060

Conclusions

Based on the findings of fact, the committee presents the following conclusions:

1. The misadministration of iodine-131 to two patients at MD-ORAU on September 4, 1973, was due to technician error.
2. The error was not the result of inadequate qualification, training, or experience of the technician.
3. The misadministration did not result from noncompliance with published safety procedures.

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4. The error in dose preparation was not detected prior to administration because the published safety procedures concerning dose checks and verification were inadequate.
5. The misadministration was not detected as soon after administration as it could have been (e.g., at the 4-hour uptake count) due to the technician's unfamiliarity with expected or normal uptake results, and/or failure to promptly analyze the 4-hour uptake results. However, this did not result in any corrective action delay or other problem, since no corrective action would have been prescribed by the physician at that time in this case.
6. There were no instrument or equipment malfunctions that contributed to the misadministration.
7. Calibration procedures for insuring accuracy and precision of the dose verification equipment were not adequate.
8. MD-ORAU does not have well defined or documented guidance concerning the matter of divulging errors of omission or commission involving procedures or treatments of patients.

Recommendations

1. It is recommended that a reevaluation of the MD-ORAU published safety procedures be accomplished. New safety procedures are already being formulated and implemented by ORAU; however, additional emphasis should be placed on development of strict procedural controls for dose preparation, dose verification, and patient safety.
2. It is recommended specifically that new safety procedures require that dose checks or dose verifications be made by a qualified individual other than the individual who prepared the dose.
3. It is recommended that calibration procedures for the dose verification equipment be upgraded. Such procedures should include routine use of certified standards.
4. It is recommended that MD-ORAU clarify and document its policy regarding communications to patients concerning errors or misadministrations in clinical nuclear medical procedures or services.
5. It is recommended that the AEC-ORO clarify its policy on reporting by its contractors when misadministration of radioisotopes to patients has occurred.

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UNITED STATES
ATOMIC ENERGY COMMISSION

OAK RIDGE OPERATIONS
P.O. BOX E
OAK RIDGE, TENNESSEE 37830

AREA CODE 615
TELEPHONE 483-8611

September 13, 1973

Dr. William G. Pollard
Executive Director
Oak Ridge Associated Universities
Post Office Box 117
Oak Ridge, Tennessee

Dear Dr. Pollard:

INVESTIGATION OF ^{131}I INCIDENT OF SEPTEMBER 4, 1973

The subject incident involving the administration to two patients of ^{131}I in excess of prescribed quantities for diagnostic purposes points out a need for reevaluation of ORAU's internal procedures and controls in such matters. Hence, we have determined that a formal investigation should be undertaken to obtain pertinent information which may be instrumental in the prevention of future occurrences of this nature. The following individuals are hereby appointed to serve on the investigation committee:

Richard E. Benson, Chairman, AEC-ORO
W. T. Thornton, AEC-ORO

Mr. Kenneth D. McCasland of our Chief Counsel's office has been assigned to act as legal advisor to the committee.

The committee shall follow the guidance of AEC and OR Manual Chapters 0502 in investigating this incident. A report of findings and recommendations is expected by October 30, 1973.

Your cooperation in this investigation will be appreciated.

Sincerely,

A handwritten signature in cursive script that reads "James H. Hill".

James H. Hill
Assistant Manager for Operations

OSH:WAJ

cc: C. W. Hill, OCC
J. A. Lenhard, R&TS
W. H. Travis, S&EC

Appendix 1

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PRIVACY ACT MATERIAL REMOVED

Identification of Personnel

Patient One:

Patient Two:

Employee A:

Employee B:

Employee C:

MD-ORAU Physician: C. Lowell Edwards, M.D.

PRIVACY ACT MATERIAL REMOVED

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Appendix 2

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FORM P-4A

MEMORANDUM

TO Dr. Edwards; Roger Cloutier; Bill GibbsDATE 5 September 1973

SUBJECT _____

PRIVACY ACT MATERIAL REMOVED

COPIES TO _____

On September 4, 1973, two patients, _____ and _____ were scheduled to be given orally 0.030 mCi of I-131 for a thyroid uptake and scan.

Usually the radioactivity prescribed is given in capsule form, however since these were not available, the radioactive I-131 was prepared in liquid form instead. The radioactive I-131 used was withdrawn from an oriodide bottle from Abbott, Lot Number Od 451-47; activity as of 8-17-73 1.82 mCi/ml.

On September 4, 1973 the calculation of the I-131 material was 0.38 mCi/ml which would mean that for a 0.030 mCi dose, 0.079 ml should have been withdrawn from the bottle. However an error was made in that 0.79 ml was actually withdrawn making the dose ten times greater than was prescribed. I did not realize this error at the time the dose was prepared however, since we seldom give diagnostic levels of I-131 in liquid form, I thought it be advisable to have someone check both cups before given to the patients. I did call for a Radiation Safety Officer to measure the radioactivity in the cups on the dose calibrator. I waited for half an hour and got no response, therefore I proceeded to check the doses myself. I did in fact place both cups on the dose calibrator and expected to get a reading of around 30 microcuries each. Instead, each cup read 284 microcuries which I interpreted as 28.4 microcuries. I actually placed a decimal point in my mind that wasn't there. I expect that because I knew the patients were waiting, I was trying to hurry and made this error. I am very sorry.

Harold D. Hodges

Harold D. Hodges

PRIVACY ACT MATERIAL REMOVED

rp

Appendix 3

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Qualifications of Technician Preparing Dose (Harold D. Hodges)

The technician is a graduate of Cumberland County High School with special interest in general science. In 1958 he obtained a B.S. degree from Tennessee Polytechnic Institute (now Tennessee Tech University) with a major in biology and a minor in chemistry. After teaching science in the Oak Ridge High School system for approximately five years he joined the ORAU Medical Division as a Senior Laboratory Technician. His first assignment was within the Division's whole-body counting program and he has consistently earned above average and excellent merit ratings. During the first year of employment, the technician assisted with a number of basic research studies in animals using radioactive materials. During the first eight years of his employment he routinely prepared radioisotope doses for administration to a large number of animals and occasionally assisted with preparation of doses for human use. After the isotopes were administered, he followed each animal through experimental procedures while making various scans, whole-body counts, autoradiography studies, and other bioassay techniques. From these procedures he became very proficient in understanding how an administered small dose of an isotope would be metabolized by an animal's biological system.

When this employee joined the Medical Division there was not a recognized training program for certified radioisotope technicians. Therefore, most of his training was received under the supervision of an Associate Scientist who was in turn under the direction of a senior staff member holding the Ph.D. and M.D. degrees. In recent years the ORAU Special Training Division with cooperation of the Medical Division has conducted courses in radioisotope techniques both for physicians and technicians. Mr. Hodges contributed to the organization of course contents and frequently served as an instructor.

Appendix 4

Report of a Misadministration of a Radiopharmaceutical at ORAU

On September 4, 1973 two patients inadvertently received 0.284 mCi of iodine-131, approximately 10 times the usual dose (0.03 mCi) given at ORAU for thyroid scans. The patients, a 42-year-old woman and a 51-year-old woman, were referred from Drs. Seay and Dew for thyroid uptake and scan studies to aid in the clinical evaluation of their enlarged thyroid glands. The tests were being done under the provisions of an elapsed ORAU contract to provide nuclear medicine services to the Oak Ridge Hospital of the Methodist Church. (This contract is currently in the process of being renewed at the hospital's request).

The misadministration was discovered at the time of the scan on September 5, 24 hours after the doses were given. In addition to myself, Mr. Cloutier, Office of Radiation and Chemical Safety at ORAU, and the AEC Health and Safety Branch were notified of the incident. The next morning, September 6, the patients and their physicians were apprised of the error and of our assessment of the probability of injury.

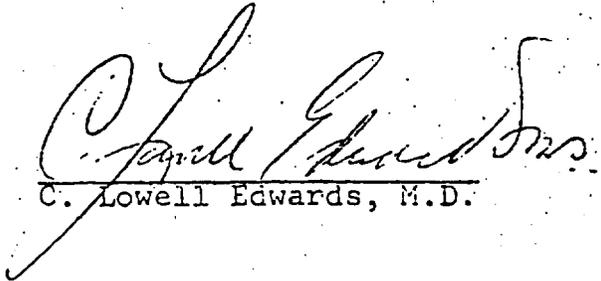
Our investigation of the incident yielded the following facts and conclusions:

1. The misadministration resulted from an arithmetic error on the part of a technician in calculating the volumes of the liquid dose - a misplaced decimal.
2. His initial arithmetic error was then compounded by his failure to pay close enough attention to the location of the decimal point on the read out from the dose checker.
3. The error was detected when in the process of setting up the scanner, the count rates were found to be about 10 times the expected rates.
4. There was no procedural violation of the published Radiation Safety Precautions for Administering Radiopharmaceuticals. However, had our newly adopted procedures, presently at the printers, been in effect, this error in dosage would most probably not have occurred. The new regulations call for a dose check on all doses, regardless of size, by someone other than the person who prepares the dose.
5. The thyroid uptakes and the estimated radiation absorbed in the whole body, thyroid and gonads, are shown on the accompanying report from Evelyn Watson.

Appendix 5

6. It is our opinion that the radiation received by the patient from these doses poses no risk of injury or remote illness to them. The patients have been informed of this opinion.

Regarding corrective action to provide assurances that such an accident is not repeated, the new procedures for handling and administering radiopharmaceuticals will be implemented as soon as the newly printed memorandum is returned from the printers and can be circulated. In the meantime, all nonencapsulated doses, regardless of the size, will be transported from the radiopharmaceutical preparation lab to the patient area by health physics personnel who will also assay the dose on the dose checker prior to its administration.



C. Lowell Edwards, M.D.

gd

cc: Dr. Gould Andrews
Mr. James Berger
Mr. J. H. Harmon
Mr. Roger Cloutier

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MEMORANDUM

TO Dr. C. Lowell Edwards

DATE 11 September 1973

SUBJECT RADIATION DOSES TO PATIENTS FROM I-131 ADMINISTRATION

COPIES TO Mr. Harmon, file

PRIVACY ACT MATERIAL REMOVED

I have calculated the radiation dose received by _____ and _____ from the administration of 300 microcuries of I-131 on September 4, 1973. The calculations were based on the following assumptions:

Patient	Weight	Mass of thyroid (g)	¹³¹ I uptake by thyroid (%)	Biol. half-time in thyroid (days)	Biol. half-time in rem. of body (days)
	unknown	40	28	138	0.35
	unknown	25*	2	138†	0.35

* Almost all of the iodine in 1/10 of the gland.

† Half-time probably shorter than this, but since exact value was unknown, I used the biological half-time for standard man.

Since the patients' weights were not known, the total-body dose was based on the mass for standard man (70 kg).

The following table lists the estimated doses the patients received.

Patient	Radiation Dose (rad/300 µCi adm.)		
	Total-body	Thyroid	Ovaries
	0.24	240	0.16
	0.050	280*	0.060

* This is the dose to the 1/10 of the gland which retained the iodine; the remaining thyroid tissue probably received about 2 rad.

PRIVACY ACT MATERIAL REMOVED

Evelyn Watson
Evelyn Watson

EW:vrs

Appendix 6

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NUCLEAR MEDICINE CONSULTATION REQUEST:

Wt. 10 - 6-21-73
7 23-31
Op

Pt's Name _____ Age 72 Sex _____ Location _____

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Diagnosis _____ Walking _____ Stretcher _____

Purpose of Consultation _____

I-131 uptake + Scan

Clinical History _____

Referring Physician *Dr. Gray* Chart No: _____

REPORT:

Type of Study I-131 uptake and scan

Nuclide I-131 Pharmaceutical _____

Date 4 Sept 73 Dose 0.284 mCi Route by mouth

Comment:

This patient was inadvertently given a larger dose of I-131 than the standard for the uptake and scan, but the scan shows a diffusely enlarged thyroid gland with no cold spots or areas of increased activity. There is no evidence of extra thyroidal tissue. The thyroid uptake is 12% at 4 hours, 28% at both 24 and 48 hours. These findings are compatible with a normal functioning enlarged goiter.

PRIVACY ACT MATERIAL REMOVED

6 September 1973
Date

C. L. Edwards
Signature
C. L. Edwards, M.D.

NUCLEAR MEDICINE CONSULTATION

Pt's Name _____ Type of Study I-131 uptake and scan

Date 6 September 1973
Signature _____

4003958

NAME: Keller, Donna
(last) (first) (middle)

W.E.

Pt's Name _____ Age 51 Sex _____ Location _____

PRIVACY ACT MATERIAL REMOVED

Diagnosis _____ Walking _____ Stretcher _____

Purpose of Consultation _____
I-131 uptake + scan.

Clinical History _____

Referring Physician Dr. Dew Chart No: _____

REPORT:

Type of Study I-131 uptake and scan

Nuclide I-131 Pharmaceutical _____

Date 4 Sept 1973 Dose 0.284 mCi Route by mouth

Comment:

This patient was inadvertently given a dose of I-131 ten times the customary dose. The scans show the radiotracer to have accumulated largely in a single focus of activity at the lower pole of the right lobe of the thyroid gland. The activity in the rest of the right lobe and the entire left lobe is much less intense and there does appear to be some lack of homogeneity. The size of these lobes are difficult to evaluate on the basis of the scan. The uptake over the entire thyroid gland is 2% at 4 hours, 1% at both 24 and 48 hours. This finding is compatible with a hyperfunctioning adenoma of the thyroid gland, but based on findings on palpation I believe that these findings are also compatible with diffuse thyroiditis involving the entire gland except for either a functioning adenoma or a small remnant of normal thyroid.

PRIVACY ACT MATERIAL REMOVED

6 September 1973
Date

C. L. Edwards
Signature
C. L. Edwards, M.D.

NUCLEAR MEDICINE CONSULTATION

Pt's Name _____ Type of Study I-131 uptake and scan

Date 6 September 1973 _____
Signature

NAME: WALTER HUBBARD
(LAST)
(FIRST)
(MIDDLE)

PRIVACY ACT MATERIAL REMOVED

W. Seary

Patient _____

Date dose to be given 9-4-73

Isotope 131 I Quantity 0.03 mCi

Route P.O. Form Thyroid uptake

Dose prescribed by C. F. Edmund

Dose Identification OD45147

Amount to be used cont of cup cc

Radiation Check Yes No

Dose Administered _____

Date 9-4-73

Time 1000

Doctor _____

Technician Hodges

4003960

Patient _____

Date dose to be given 9-4-73

Isotope 131 I Quantity 0.03 mCi

Route P.O. Form Thyroid uptake

Dose prescribed by Dr. Seary

Dose Identification OD45147

Amount to be used cont of cup cc

Radiation Check Yes No

Dose Administered _____

Date 9-4-73

Time 0920

Doctor _____

Technician Hodges

PRIVACY ACT MATERIAL REMOVED

RADIATION SAFETY PRECAUTIONS FOR ADMINISTERED
RADIOPHARMACEUTICALS

I. INTRODUCTION

During the administration of radiopharmaceuticals, there is the potential for contaminating medical facilities and equipment and unnecessarily exposing staff, visitors, and other patients. Even after the radionuclide has been administered, the patient may cause contamination or exposure problems for some time. To minimize these radiation safety problems, the Medical Division observes the following policies and procedures.

II. RADIOPHARMACEUTICAL ADMINISTRATION

All radioactive materials must be administered by ORAU clinicians in ORAU facilities. Any new procedures or radiopharmaceutical not previously used at ORAU must be reviewed and approved by the Human Use Committee.

A. Prescription of Test or Treatment

The patient's physician will:

Prescribe the procedure.

Discuss the procedure with the patient and determine whether any contraindications exist before the radiopharmaceutical is administered.

Determine the isotope, activity, chemical form, and time of administration.

Notify the radioassay and radiopharmaceutical sections to have the radioisotope available when needed.

Arrange for scans, whole-body counts, laboratory tests, etc.

If the dose is 1 millicurie or above, obtain approval of the patient or his guardian. (Informed Consent forms Fig. 1).

B. Preparation of Radioisotope Dose

Radioisotopes are prepared by the clinical radioassay or radiopharmaceutical section who, upon request by the physician, will:

Perform the necessary calculations, volume dilutions, pipetting, etc.

Conduct required tests to assure accuracy and safety of the pharmaceutical.

The preparer of the dose will then:

Complete the applicable portions of the forms (Fig. 2 and 3) that accompany the radioisotope dose.

Notify the nurses' station to ready the patient for the administration of the dose.

C. Preparation of Patient

The nursing staff will perform the necessary setup and preparation. When possible, radioisotopes will be administered in the treatment room and an IV-drip technique will be used for intravenous doses. The use of absorbent paper, secondary containers, syringe shields, "hot" waste containers, gloves, etc. will minimize unnecessary exposure and the spread of contamination.

D. Transport of Radiopharmaceuticals to the Treatment Area

When preparations are complete, if the isotope contains more than 1 millicurie of activity, the nurses will notify the Radiation and Chemical Safety Office (R&CSO) who will transport the radioisotope to the treatment area using a shielded cart. If the isotope contains less than 1 millicurie of activity, the physician or person preparing the dose may transport it to the treatment area.

E. Dose Check

The Radiation and Chemical Safety Office representative (or in his absence the person who prepared the dose or the physician administering it) will:

Verify for accuracy each radioisotope administered in liquid form or containing more than 1 millicurie using the dose-check instrument. (Instructions for using the equipment are found in its log book.)

II. E. Call to the attention of the physician administering the isotope discrepancies greater than 10%.

Assay the remaining contents of the isotope container from which the dose was removed to confirm the amount removed for administration.

F. Administration

The physician must supervise all radioisotope administrations involving 1 millicurie of activity.

Involved personnel will wear appropriate protective clothing and monitoring devices.

Unnecessary persons will be prohibited from the treatment area.

Radiation and Chemical Safety personnel or the person who transported the radioisotope will record on the dose and record forms (Fig. 2 & 3) the administration time, the name of the physician, and other required information.

Nurses will complete the warning sign (Fig. 4) and affix it to the patient's bed.

G. Cleanup, Test Scheduling, Miscellaneous

After the administration of the radioisotope, the staff involved will:

Check for contamination of themselves and the equipment used.

Place disposable items in the radioactive-waste containers.

The person who transported the radioisotope is responsible for the return of any unused portion of the storage vault along with the dose slip (Fig. 2).

Nurses will:

Notify the scanning and counting equipment operators of the administration time and arrange schedules with them.

Place the informed consent form (Fig. 1) and record form (Fig. 3) in the patient's record.

III. CONTROL AND RESTRICTIONS OF PATIENT

To reduce unnecessary radiation exposure to others in the vicinity, patients administered radioisotopes may be restricted in their movements until the radiation levels and risks of contamination are within acceptable limits. Exceptions to the following guides are, of course, necessary. For instance, patients may be required to visit other hospital areas for diagnostic tests. In such instances the patient's physician with the help of radiation safety personnel will determine the precautions to be observed.

When the patient receives less than 1 millicurie of an isotope we do not consider him a significant contamination or exposure problem. If the amount is greater, we will restrict his movements within ORAU.

A. Facilities

Patients receiving a dose larger than 1 millicurie normally occupy rooms 304-315 at the south end of the hospital wing, thereby limiting potential contamination to smaller areas. Since patients who have received large quantities of radioisotopes, e.g., 100 mCi ^{131}I , pose an external radiation hazard to staff, visitors, and other patients, two single-occupancy rooms, 311 and 315, are provided for their use.

B. Control of Contamination

Patients administered more than 1 millicurie of a readily excreted isotope are restricted to their rooms for at least 24 hours after administration. The physician will:

Inform the patient of the precautions necessary to restrict the spread of contamination.

Instruct him to notify the nurse if contamination is suspected.

All hospital personnel and visitors should minimize the frequency of entries to rooms during this type of treatment. Hospital staff will:

Frequently use the instruments in the treatment room or nurses' station to monitor hands and feet.

Dispose of all waste according to radioactive waste disposal procedures.

When the potential for contamination is high, the Radiation and Chemical Safety Office will assist in deter-

mining necessary steps to control the release and spread of contamination and will increase area monitoring to ensure its early detection.

C. Control of External Radiation

When a patient receives large quantities of radioactive material, he may emit significant levels of external radiation. When possible such patients will occupy rooms 311 or 315. Patients administered radioisotopes will remain in their rooms until radiation levels measured at one meter from them are below 2 milliroentgens per hour.

D. Release of Patients

The general AEC requirements is that patients receiving radioisotopes must be hospitalized until their body content is less than 30 millicuries. Below this level of activity, they may be released with instructions from their physician for limiting radiation exposures to others in the household.

If the patient remains in the ORAU facilities, he will conform to the restrictions described in III, B & C.

Only the R&CSO can direct the release of patients from radiation contamination control. At this time the nurses will return the bed warning-sign (Fig. 4) to the R&CSO.

IV. VISITOR CONTROL

Visitors to patients restricted for contamination control should be kept to a minimum during the 24 hours after administration of more than 1 millicurie of excretable activity. For protection from external radiation exposure, visitors should not enter areas where radiation levels exceed 2 milliroentgens per hour.

V. DECEASED PATIENTS

When a patient dies the nursing staff will compile a history of the radioactive materials he has received, using the form shown in Fig. 5. The R&CSO, upon notification by the pathologist, will survey bodies containing more than 5 millicuries of radioisotopes and will determine the need for handling precautions or restrictions during autopsy procedures.

OAK RIDGE ASSOCIATED UNIVERSITIES

Oak Ridge, Tennessee

Authorization for the Administration of Radioactive Substance

I hereby authorize the staff of the ORINS Medical Division to administer to _____ the following radioactive substance _____
Nuclide Chemical

_____ Dose Route of administration

The purpose of this procedure has been explained to me as being:

Its relevance to my condition, the risks and any possible alternative have been explained to me.

Name of patient

Date

Figure 1. Informed consent form.

4003966

Patient	_____
Date dose to be given	_____
Isotope	_____
Quantity	_____
Route	_____
Form	_____
Dose prescribed by	_____

Dose Identification	_____
Amount to be used	_____ cc
Radiation Check	Yes No

Dose Administered	
Date	_____
Time	_____
Doctor	_____
Technician	_____

Figure 2. Dose information form.

RADIOISOTOPE TREATMENT

Patient's Name _____ No. _____
Date _____
Time _____

Isotope _____ Dose _____
Source _____
Shipment No. _____
Dose Measured by _____
Method _____
Dose Approved by _____
Route of Administration _____
Administered by _____
Wt. Carrier Added _____
Wt. Inactive Isotope _____
Remarks _____

Isotope _____ Dose _____
Source _____
Shipment No. _____
Dose Measured by _____
Method _____
Dose Approved by _____
Route of Administration _____
Administered by _____
Wt. Carrier Added _____
Wt. Inactive Isotope _____
Remarks _____

Isotope _____ Dose _____
Source _____
Shipment No. _____
Dose Measured by _____
Method _____
Dose Approved by _____
Route of Administration _____
Administered by _____
Wt. Carrier Added _____
Wt. Inactive Isotope _____
Remarks _____

Figure 3. Radioisotope treatment record .

4003968

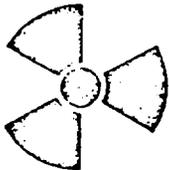
CAUTION	PATIENT _____
	DOCTOR _____ DATE _____
	RADIOACTIVE MATERIAL _____
ADMINISTERED RADIOACTIVE MATERIAL	QUANTITY _____ FORM _____
	ROUTE: ORAL _____ IV _____ IP _____ OTHER _____
	SPECIAL PRECAUTIONS _____
	REMOVE SIGN ON _____

Figure 4. Warning sign for patient bed.

To: Radiation Safety Officer

Patient _____

Died _____

Radioisotopes administered:

1. In last 30 days:

Type	Quantity	Date	Route
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. In last six months: Half-life greater than three months

Type	Quantity	Date	Route
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Nurse _____

The Radiation Safety Officer should be contacted for assistance in surveying bodies that contain more than 5 millicuries of any isotope.

Figure 5. Radioisotope treatment history.

4003970

SIGNATURES OF THE INVESTIGATING COMMITTEE

R. E. Benson

R. E. Benson, Chairman

W. T. Thornton

W. T. Thornton