

ST. JOHN MEDICAL CENTER • 1923 SOUTH UTICA AVENUE • TULSA, OKLAHOMA 74104 • 918 / 744-2345

January 17, 1986

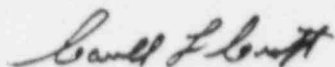
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Re: License 35-00376-05

Gentlemen:

Please find enclosed an application to renew our teletherapy By-products Materials License. We have followed the format of the non-existent NRC form 313T as shown in the "Guide for the Preparation of Application for Licenses in Medical Teletherapy Programs" dated March, 1982.

Sincerely,


Carroll Craft
Senior Vice President

cc:ad

Enclosures
\$350.00 Application Fee

Applicant 7A Jan-3-TV
Check No 55657
Amount Fee Charged 350 / 7A
Check No 127/7A
Date Paid Recd 1/27/86
Paid By me

RECEIVED
JAN 27 110-06

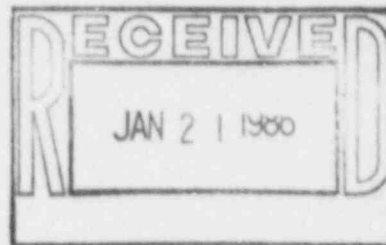


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REG4 LIC30
35-00376-05 PDR

460913

ST. JOHN MEDICAL CENTER • 1923 SOUTH UTICA AVENUE • TULSA, OKLAHOMA 74104 • 918 / 744-2345

ST. JOHN MEDICAL CENTER



1a. Name of Applicant

St. John Medical Center
1923 S. Utica Avenue
Tulsa, Oklahoma

(918) 744-2071

1b. Radioactive Material used at the above address in the basement of the North Tower.

2. For information regarding this application contact

Keith M. Jones, Ph.D.
Radiation Physicist

(918) 744-2071

3. This is a renewal application

4. Individual Users

Avram E. Rosenthal, M.D.
Alan E. Feen, M.D.
Richard F. Barbee, M.D.
Keith M. Jones, Ph.D.

5. Radiation Safety Officer

Keith M. Jones, Ph.D.
St. John Medical Center
1923 S. Utica
Tulsa, Oklahoma 74104

6. Seal sources covered by this application

Co-60 Manufactured by General Electric per Dwg. No. 10603912 or 106D3949,

OR

Co-60 Manufactured by Neutron Products, Inc. Models NPI-20-7000W, NPI-20-7500W and
NPI-20-8000W

2 Sources of not more than 9000 Ci each



460913

7. Teletherapy Unit:

Siemens Corp. Gammatron S

8. Use:

Human Use plus
Instrument calibration, radiation safety and radiation physics measurements
and
Irradiation of human blood products
We request user status for Dr. Jones for all uses except Human use

9. Film Badge Supplier

R.S. Landauer Changed Monthly

10. Members of the Isotope Committee are:

Carroll Craft, Administrator
Keith M. Jones, Ph.D. Radiation Physicist
Alan E. Feen, M.D., Radiation Therapist
William Sheehan, M.D., Pathologist
Richard Laughlin, M.D., Nuclear Medicine
Antonio DeLeon, M.D. Cardiology
Elaine Hadley, R.N., Clinical Director, Nursing Service

Responsibilities of the committee are attached.

11. User Training and Experience

Drs' Feen, Rosenthal and Barbee are currently by-product material users on this license

Supplement A for Dr. Jones is attached

12. Instrumentation

1. Survey Meters

- a. Victoreen Model 491, one instrument, min. 0 -.1mR/hr.
max. 0 -100mR/hr.
- b. Tracerlab model SUIH, one instrument, min. 0-15mr/hr.
max. 0-1500mR/hr.

2. Beam on Monitor

Manufacturer - Victoreen Model 850 Gamma Alarm Monitor
One Instrument
No back up battery; connected to hospital's emergency
power generators

3. Dosimetry System

- a. Electrometers Keithley 602 - one instrument
Keithley 616 - one instrument
Victoreen R-meter model 570 - one instrument

b. Probes

Nuclear Enterprises	-	.6cc Farmer probe, one probe
Capintec	-	.6cc probe, Pr-06C, one probe
Capintec	-	.6cc probe, Pr-06G, one probe
Capintec	-	PS-033 parallel plate chamber, one chamber
Victoreen	-	Model 621 High energy chamber, one chamber

Ranges

Victoreen - 100 R fullscale all other chambers
& electrometer combinations .14-750R

4. Other

a. Nuclear Chicago Model 1185, Automatic Gamma Counting System.

b. Picker Spectroscaler III with well counter

17. Operating and Emergency Procedures

See attached "Safety Procedures for Radiation Therapy Personnel" and "Emergency Procedures for Radiation Therapy Personnel"

18. Instruction of Personnel

Sections from the hospital's procedures manual concerning radiation safety practices for housekeeping, security, and maintenance employees are attached. Radiation Therapy department personnel training is stipulated in the attached SOP's. Relevant parts of these procedures will be reviewed with each employee when they start work and annually thereafter at employee evaluation or as stipulated in the SOP which ever is more frequent.

19. Leak Tests

See procedure in attached "Safety Procedures for Radiation Therapy Personnel"

21. ALARA Program attached

TRAINING AND EXPERIENCE AUTHORIZED USER OR RADIATION SAFETY OFFICER

1. NAME OF AUTHORIZED USER OR RADIATION SAFETY OFFICER Keith M. Jones, Ph.D.		2. STATE OR TERRITORY IN WHICH LICENSED TO PRACTICE MEDICINE		
3. CERTIFICATION				
SPECIALTY BOARD A	CATEGORY B	MONTH AND YEAR CERTIFIED C		
American Board of Radiology	Radiological Physics	December 1978		
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	Hampden-Sydney College (1963-67) Univ. of Wisconsin (1967-74)	48 176 <u>224</u>	32 32 <u>64</u>	
b. RADIATION PROTECTION	Univ. of Wisconsin (1967-1974)	64	64	
c. MATHEMATICS PERTAINING TO THE USE AND MEASUREMENT OF RADIOACTIVITY	Hampden-Sydney College (1963-1967)	48	32	
d. RADIATION BIOLOGY	Univ. of Wisconsin (1967-1974)	96	32	
e. RADIOPHARMACEUTICAL CHEMISTRY	- -	0	0	
5. EXPERIENCE WITH RADIATION. (Actual use of Radioisotopes or Equivalent Experience)				
ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
Co-60	7000 Ci	Univ. of Wisconsin & St. John Med. Center	2 yr. & 11 yr.	Human
Cs-137	1 Ci	St. John Med. Center	11 years	Radiation Dosimetry and Radiation Safety and Instrument Calibration and repair
Ra-226	150 mCi	" "	"	
Rn-222	30 mCi	" "	"	
Au-198	50 mCi	" "	"	
I-125	30 mCi	" "	"	
I-131	150 mCi	" "	"	
Tc-99m	100 mCi	" "	"	



STANDARD OPERATING PROCEDURE

Radiology

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RADIATION SAFETY COMMITTEE

POLICY:

St. John Medical Center will have a Radiation Safety Committee whose composition and duties are as listed below.

Composition

Administrator - Chairman
Radiation Safety Officer
Radiologist specializing in Nuclear Medicine
Licensed user from Pathology
Radiation Therapist
Nursing Representative
Radiology Department Representative
Cardiologist with Cath Lab training

Charge

This committee will ensure that all procedures which involve the use of radioactive material or radiation producing equipment are performed so as to keep the radiation exposure of patients and employees as low as reasonably achievable (ALARA) subject to the need for accurate diagnostic studies and relevant financial constraints. The committee will oversee all aspects of the hospital's by-product materials licenses to ensure compliance with NRC license requirements.

Duties

1. Be familiar with all federal and state regulations that pertain to the use of radioactive material or radiation producing equipment at St. John Medical Center. These regulations include, but are not limited to, NRC regulations and license conditions, information submitted on the by-product materials license application, and regulations of the Oklahoma State Department of Health. The Committee will ensure that the by-product material license is amended if there is any change in the information submitted with the license application or previous amendments and that the appropriate individuals are advised of changes in the license.
2. Review the training and experience of all individuals who use radioactive materials or radiation producing equipment (including physicians, technologists, physicists and pharmacists) and determine that their qualifications are sufficient to enable them to perform their duties safely and in accordance with applicable regulations. Notification that a physician has been approved by the NRC as a by-products material user will be sent to the Medical Staff Office.
3. Establish a program to ensure that all individuals whose duties may require them to work in the vicinity of radioactive material or radiation producing equipment are properly instructed so that they may perform their duties in a safe manner with minimal radiation exposure.

Supersedes No previous policy

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Administration
Radiology

PREPARED BY

Keith Jones, Ph.D.

APPROVED

Sister M Therese Gottschalk



STANDARD OPERATING PROCEDURE

RADIATION SAFETY COMMITTEE

Radiology

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4. Review and approve requests for the use of radioactive material or radiation producing equipment to ensure that the radiation exposure of the patient and work is justified by the importance of the information gained from the procedure or by the therapeutic benefit to the patient.
5. Review SOP's for the performance of procedures involving the use of radioactive material or radiation producing equipment to ensure that these procedures are performed in a manner that tries to maximize the benefit to the patient and minimize the radiation exposure of the patient and workers. SOP's will include, but not be limited to:
 - a. Requirements that workers submit to bioassays or other special types of monitoring before or after specific procedures.
 - b. Regulations for the use, transport, storage and disposal of radioactive materials used in the nuclear medicine procedures.
 - c. Rules to guide workers who are in contact with patients containing radioactive material. These rules should include procedures to be followed during general nursing care, emergency surgical procedures, autopsy and discharge from the hospital.
6. Review programs that determine whether radiation producing and radiation measuring equipment are operating properly.
7. Make recommendations on the staffing of various departments that use radioactive material or radiation producing equipment if the committee feels a change in staffing would benefit the radiation safety program.
8. Establish guidelines as to who will be required to wear radiation badges and establish policies to ensure that badged individuals consistently wear their badges.
9. Review personnel exposure records at least quarterly and investigate exposures that exceed those stated in the hospital's ALARA policy.
10. Delegate appropriate authority to the radiation safety officer so that he may carry out the intentions of the committee on a day-to-day basis.
11. Establish a program to review the entire radiation safety program at least annually to determine that all activities are being conducted safely and in accordance with all relevant regulations. This review shall include an examination of all records, reports from the radiation safety officer, results of inspections by state or federal agencies, written safety procedures, and the adequacy of the hospital's management control systems.
12. Recommend remedial action to correct deficiencies identified in the radiation safety program.

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STANDARD OPERATING PROCEDURE

RADIATION SAFETY COMMITTEE

Radiology

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13. Maintain written records of all committee meetings, actions, recommendations and decisions.
14. Hold meetings at least quarterly. A quorum consists of at least 50% of the members but must include the hospital's administrator and the radiation safety officer.
15. Observe confidentiality policies.

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STANDARD OPERATING PROCEDURE

Radiology

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1-13-86

SUBJECT:

Program for maintaining occupational radiation exposures at medical institutions (ALARA)

POLICY: St. John Medical Center will maintain a program which results in employee and physician exposures to radiation being kept as low as reasonably achievable (ALARA).

PROCEDURE:

I. Management Commitment

- a. St. John Medical Center is committed to the following program for keeping exposures (individual and collective) as low as reasonably achievable (ALARA). The necessary written policy procedures and instructions to foster the ALARA concept will be formulated and promulgated by the hospital's Radiation Safety Committee (RSC) with assistance and guidance from the hospital's Radiation Safety Officer and from U.S. NRC Guides 8.10 and 8.18.
- b. The Radiation Safety Committee will annually review the radiation Safety Program in consultation with the Radiation Safety Officer.
- c. Modification to operating and maintenance procedures and to equipment and facilities will be made where they will significantly reduce exposures at reasonable cost. The RSC will be able to demonstrate that improvements have been sought, that modifications have been considered, and that they have been implemented where practicable. Where modifications have been considered but not implemented, the RSC will be prepared to describe the reasons for not implementing them.
- d. In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the doses received by all exposed individuals will also be maintained at the lowest practicable level.

II. Radiation Safety Committee (RSC)

a. Review of Proposed Users and Uses

1. The RSC will establish a program to review the qualification of each physician who proposes to use radiation or radioactive material at St. John Medical Center. The qualification should include the ability to take appropriate measures to maintain exposure ALARA.
2. The RSC will establish a program to ensure that a SOP concerning radiation safety is formulated for each procedure involving radiation or radioactive material. SOP's should be written prior to the routine use of a new procedure and should be specifically designed so as to reduce the radiation exposure of employees, physicians and patients.

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Surgery GI Lab
Radiology Cardiology
Radiation Therapy
Pathology/Nursing Service

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Radiology

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SUBJECT:

Program for maintaining occupational radiation exposures at medical institutions (ALARA)

b. Delegation of Authority

1. The RSC and the hospital administration will delegate sufficient authority to the RSO for enforcement of the ALARA concept.
2. The RSC and the hospital administration will support the RSO in those instances where it is necessary for the RSO to assert his authority. Where the RSO has been overruled, the Committee or Administration will record the basis for it's action.

c. Review of ALARA

The RSC will perform an annual review of all radiation safety programs.

1. The RSC will encourage all users to review current procedures and develop new procedures as appropriate for ways to implement the ALARA concept.
2. The RSC will review all instances of deviations from the ALARA philosophy. Information in support of the review will normally be supplied by the RSO.
3. The RSC will evaluate the institution's overall efforts for maintaining exposures ALARA. This review will include the efforts of the RSO, authorized users, and workers as well as those of management.

d. Public Statement of Commitment by the RSC to ALARA

All elements of St. John Medical Center will be informed of the RSC's commitment to the ALARA concept.

1. The RSC will ensure that employees are aware of the RSC's commitment to the ALARA philosophy.
2. The RSC will demonstrate it's commitment to the ALARA concept through the methods employed in it's review of proposed users and uses.

III. Radiation Safety Officer (RSO)

- a. Periodic Review and Audit of the Radiation Safety Program for compliance with ALARA concepts. Frequent reviews of procedures will be conducted.

1. The RSO will review and audit, on a regular basis (at least annually), the effectiveness of his own radiation protection program in maintaining doses (individual and collective) ALARA.

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Radiology

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SUBJECT:

Program for maintaining occupational radiation exposures at medical institutions (ALARA)

2. The RSO will review exposures of authorized users and occupational workers to determine that their exposures are ALARA.
3. The RSO will review radiation levels in unrestricted and restricted areas and releases of effluents to unrestricted areas to determine that they are at ALARA level.
- b. The RSO's Education Responsibilities for an ALARA Program
 1. The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.
 2. The RSO will insure that authorized users, occupational workers and ancillary personnel understand the ALARA philosophy and know that management, the RSC, and the RSO are committed to implementing the ALARA concept.
- c. Cooperative Efforts for Development of ALARA Procedures

Individuals who must work with ALARA concepts will be given opportunities to participate in formulation of procedures that they will be required to follow.

 1. The RSO will maintain close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
 2. The RSO will establish procedures for encouraging, receiving and evaluating the suggestions of individual workers for improving health physics practices.
- d. Reporting and Reviewing Instances of Deviation from Good ALARA Practices
 1. The RSO will investigate all instances of deviation from good ALARA practices and, if possible, determine the causes. When the cause is known, the RSO will propose changes in the program to maintain exposures ALARA.
 2. The RSO will report all significant instances of deviation from ALARA concepts to the RSC for review.

IV. Authorized Users

- a. New Procedures Involving Potential Radiation Exposures
 1. Physicians and/or department supervisors will consult the RSO and/or the RSC before using radioactive materials or radiation sources for substantially new and different procedures which

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Program for maintaining occupational radiation exposures at medical
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potentially involve higher than normal radiation exposure of workers. The consultation will consider the procedures to be used so as to keep exposure ALARA.

b. Responsibility of the Area Supervisor to Those He Supervises

1. The Area Supervisor will thoroughly explain the ALARA concept and his commitment to maintain exposure ALARA to all of those he supervises.
2. The Area Supervisor will ensure that his occupational workers are trained and educated in good health physics practices and in maintaining exposures ALARA.
3. Supervisors will be responsive to the radiation safety concerns of the individuals that they supervise.

c. Continuing Review of ALARA Concepts by Area Supervisors

1. Supervisors will continuously review their departments procedures to ensure that the most current methods to maintain exposures ALARA are utilized.

V. Occupational Worker

a. What the Occupational Worker Must Consider about ALARA

1. The Worker will implement ALARA procedures developed by their supervisor and the RSO.
2. The occupational worker will know what resources are available if he feels that ALARA is not being promoted on the job.
3. The occupational worker will understand the ALARA concept and will review his own working conditions and those of his fellow workers for the implementation of ALARA principles.

VI. Establishment of Action Levels in Order to Achieve Reductions in Individual Occupational Exposures

Individual exposure action levels for specific kinds or classes of operations are listed below. Quarterly exposures which exceed these levels will be investigated by the RSO and/or the RSC. The minutes of the RSC will include an account of any investigations including the cause of exposure, action taken to correct the situation and the follow-up action taken.

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SUBJECT:

Program for maintaining occupational radiation exposures at medical institutions (ALARA)

VI. a. Quarterly exposure of individuals to less than Investigational Level I.

Except when deemed appropriate by the RSO, no further action will be taken in those cases where an individual's exposure is less than Table I values for the Investigation Levels I.

b. Personnel exposures equal to or greater than Investigational Level I, but less than Investigational Level II.

The RSO will review the exposure of each individual whose quarterly exposures equal or exceed Investigational Level I. He will report the results of his reviews at the first RSC meeting following the quarter when the exposure was recorded. If the exposure does not equal or exceed Investigational Level II, no action related specifically to the exposure is required unless deemed appropriate by the Committee.

c. Exposure equal to or greater than Investigational Level II.

The RSO will investigate in a timely manner the cause(s) or all personnel exposures equaling or exceeding Investigational Level II and, if warranted, take action. A report of the investigation and actions taken, if any, will be presented to the RSC at the first meeting following completion of the investigation. The details of these reports will be recorded in the Committee minutes.

d. Re-establishment of an individual occupational worker's Investigational Level II above that Listed in Table I.

In cases where a worker's or a group of worker's exposures need to exceed Investigational Level II, a new, higher Investigational Level II may be established on the basis that it is consistent with good ALARA practices for that individual or group. Justification for a new Investigational Level II will be documented.

The RSC will review the justification for, and will approve, all revisions of Investigational Levels II. In such cases, when the exposure equals or exceeds the newly established Investigational Level II, those actions listed in paragraph C above will be followed.

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SUBJECT:

Program for maintaining occupational radiation exposures at medical institutions (ALARA)

TABLE I

<u>Type of Individual</u>		<u>Level I</u>	<u>Level II</u>
1. Nuclear Medicine Technologist)	Whole Body	125 mRem/Qt.	375 mRem/Qt.
2. Radiation Therapist)	Hands	1875	5625
3. Radiation Physicist)			
4. Radiation Therapy Technologist	Whole Body	125	375
5. Isotope Technologist	Whole Body	125	375
6. GI Lab Employees	Outside Apron	250	750
7. X-Ray Technologist)	Under Apron	60	180
8. Diagnostic Radiologist)	Outside Apron	600	1250
9. Cardiologist)			
10. Surgery Personnel)			
11. Nurses)		60	250
12. Other Employees & Physicians)			

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STANDARD OPERATING PROCEDURE

Radiation Therapy

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SAFETY PROCEDURES FOR RADIATION THERAPY PERSONNEL

POLICY

Radiation Therapy Department personnel will follow specific procedures to ensure proper functioning of department equipment.

PROCEDURES

1. Equipment checks - Cobalt-60 machine

a. Daily Checks

The radiation monitor in the cobalt room will be observed at the beginning of each working day to ascertain that the monitor lights come on when the cobalt source is exposed. Completion of this check will be indicated on the form provided. Should the monitor not work, no employees should enter the room without carrying a portable radiation monitor.

b. Monthly Checks

Once a month (preferably near the middle of the month) checks specified by the Nuclear Regulatory Commission in Chapter 35 of its regulation will be performed on the Cobalt-60 unit. Procedures for testing and record keeping will be specified by the qualified teletherapy calibration expert. Individuals who perform the tests will be designated and trained by the qualified teletherapy calibration expert. Records will be maintained for at least 5 years.

c. Yearly Checks

Once a year (on the anniversary of the most recent source installation) checks specified by Nuclear Regulatory Commission in Chapter 35 of its regulation will be performed on the cobalt-60 unit by the qualified teletherapy calibration expert. Records will be maintained for at least 5 years.

- d. Treatment of patients should be discontinued until any of the following problems have been investigated and/or repaired. Only the qualified teletherapy expert or his designee may authorize patient treatments after any of these problems.

Measured output different from posted output by more than $\pm 3\%$.

Any emergency "Off" button fails to operate

Door interlocks fail to function properly

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Keith Jones, Ph.D.

APPROVED

David J. Smith



STANDARD OPERATING PROCEDURE

Radiation Therapy

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SAFETY PROCEDURES FOR RADIATION THERAPY PERSONNEL

Optical or mechanical distance indicator off by more than 1 cm.

Timer malfunctioning

Failure of source to return to "off" position properly

2. Equipment checks - Linear Accelerator

a. Daily Checks

Prior to each days treatment the radiation therapy technologist working on the accelerator will perform a routine warm up procedure and any other tests specified by the radiation physicist.

b. Weekly Checks

Once aweek the following checks will be performed by the radiation physicist or his designee - output and energy of all radiation beams, field flatness and light field radiation field coincidence. Records will be maintained for five years.

c. Monthly Checks

In addition to the weekly checks, once each month the optical distance indicator, laser alignment, door interlocks and emergency "off" switches will be checked.

d. Yearly Checks

Once each year the following items will be checked:

Field size dependence
% depth dose tables
Tray & wedge factors
Isocentricity

- e. Treatment of patients should be discontinued until any of the following problems have been investigated and/or repaired. Only the qualified teletherapy expert or his designee may authorize patient treatments after any of these problems.

Dose monitor not functioning properly
Treatments not being terminated correctly
Gantry rotational controls not operating properly

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Samuel J. Lewis



STANDARD OPERATING PROCEDURE

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SAFETY PROCEDURES FOR RADIATION THERAPY PERSONNEL

3. Equipment Checks - Superficial X-ray machine

- a. Bi-annually the output of this machine will be checked according to a procedures established by the hospital's radiation physicist
- b. Annually this machine will undergo a complete calibration including the output at all treatment SSD's, half value thickness of all techniques and the field flatness for the different cones. The radiation physicist will write procedures to be followed when performing these checks.

4. Equipment Checks - RE-50 Rectal Unit

- a. For infrequent use, this machine should be calibrated prior to the beginning of each patient's treatment.
- b. For frequent use (more than six patients per year) this machine will be calibrated by the radiation physicist quarterly.

5. Equipment Checks - Simulator

- a. The simulator will be checked on a quarterly basis according to procedures established by the Radiation Physicist

6. Securing Treatment Machines

At the end of each day and whenever the department is going to be un-manned, the treatment machines should be turned off and the keys removed.

7. Instrument Calibration

Survey meters will be calibrated at least yearly or after any repair. The calibration will be performed by placing the survey meter at varying distances from Ra-226 or Cs-137 sources. For meters reading up to 100 mR/hr. sources equivalent to 5 to 10 mg. of Ra-226 should be used. For meters reading up to 1000 mR/hr. sources equivalent to 80 to 100 mg. of Ra-226 should be used. Specific details will be determined by the Radiation physicist but the calibration should always be performed at a time and location in the department so that no other individuals will receive any radiation exposure.

a. Dosimetry Systems

The primary dosimetry system will be sent to an AAPM accredited

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Carol E. Smith



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SAFETY PROCEDURES FOR RADIATION THERAPY PERSONNEL

calibration laboratory at least every two years. The qualified teletherapy calibration expert will make all arrangements for the calibration and will personally pack the system for shipment. The dosimetry system will be packed in a wooden box with suitably quantities of styrofoam.

The secondary dosimetry system will be compared with the primary system immediately after its calibration. The comparison will be performed by the qualified teletherapy calibration expert using the Co-60 treatment machine. This comparison will be repeated whenever it is thought to be necessary but at least yearly.

8. Source Leak Test

The Co-60 source will be tested for leakage on a semi-annual basis by either the radiation physicist or the assistant physicist. The wipe will be counted in a suitable well counter. Background and a suitable standard will also be counted. The activity of the wipe will be expressed in microcuries.

9. Radiation Therapy Department personnel will keep records for the following:

- Daily treatment machine or other equipment checks
- Weekly treatment machine checks
- Monthly treatment machine checks
- Yearly treatment machine checks
- Daily accelerator warmup
- Service reports for any treatment machine
- Survey meter calibration
- Primary Dosimetry system calibration
- Secondary Dosimetry system calibration
- Source leak tests
- Daily patient treatments
- CBC and other lab studies ordered by physicians
- Irradiation of blood
- Daily treatment machine work schedule
- Inservice attendance
- Additional items as specified by the Radiation Therapist or radiation physicist.

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STANDARD OPERATING PROCEDURE

Radiation Thera

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PERSONNEL MONITORS

POLICY

Employees in Radiation Therapy will wear radiation monitors

PROCEDURES

1. The radiation therapy technologists, physicist, assistant physicist, and the radiation therapists will be issued film badges which will be worn at the waist or on the collar. Badges will be changed monthly. Other employees may be required to wear badges by the Radiation Safety Officer. Badges should be stored in offices, lockers or in drawers in the treatment area when not being worn.
2. The Radiation physicist, assistant physicist and physicians will be issued and required to wear ring badges when handling radioactive material.

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Radiation Therapy

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EMERGENCY PROCEDURES FOR RADIATION THERAPY PERSONNEL

POLICY

Each employee in Radiation Therapy will be knowledgeable in the following emergency procedures:

A. Fire Plan

The purpose of this plan is to list the tasks that need to be done in case of a fire in the department. Because the individuals in the department vary from day to day and even from hour to hour, no attempt is made to assign specific tasks to specific tasks to specific individuals. All employees are expected to be able to carry out the entire plan or any part of it by themselves. When more than one individual is carrying out the plan, communications among the various individuals is vital if all aspects of the fire plan are to be completed satisfactorily. While these tasks are listed in the approximate order of importance, it is intended that they be performed concurrently if more than one person are implementing the fire plan.

1. Notify everyone in the immediate vicinity of the fire and remove any patients from immediate danger.
2. Dial "89" and announce a "Condition Red" in Radiation Therapy in the basement.
3. Pull one of the fire alarm boxes located near the stair wells.
4. Evacuate patients and visitors
 - up the back stairs if the fire is in the front of the department
 - out through the tunnel to the PM building or South wing if the fire is in the treatment area.
5. Remove from the department the charts of patients currently under treatment. Use a Wheel Chair.
6. Close all doors; check each room to make sure it is unoccupied.
7. Lock Co-60 source in off position
8. Shut off oxygen lines at valve outside Dr. Jones' office.
9. If practical - fight fire. Know which type of extinguisher

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EMERGENCY PROCEDURES FOR RADIATION THERAPY PERSONNEL

to use on the different types of fires and know where they are located.

B. Code Blue

The purpose of this plan is to list the tasks that need to be done in case of a code blue in the department. Because the individuals in the department vary from day to day and even from hour to hour, no attempt is made to assign specific tasks to specific individuals. All employees are expected to be able to carry out the entire plan or any part of it by themselves. When more than one individual is carrying out the plan, communications among the various individuals is vital if all aspects of the code blue plan are to be completed satisfactorily. While these tasks are listed in the approximate order or importance, it is intended that they be performed concurrently if more than one person are implementing the code blue plan.

1. Notify everyone in the vicinity of a code blue.
2. Dial "89" and report a code blue and the location
3. Start CPR
4. Call for a radiation therapist or radiologist
5. Get out the "Crash Cart", take it to the site of the emergency and plug in all electrical equipment on the cart
6. Stand in lobby and direct the "Code Blue" team to the location of the patient.

C. Radiation Emergency Procedures

If either "radiation indicating light" remains lit when a treatment has ended, proceed as follows:

1. Press "EMERGENCY RADIATION OFF" push button at upper right of console.
2. Being careful to avoid the primary beam of radiation, swivel the patient out from under the machine.
3. If the patient is ambulatory, have them get off the table and leave the room.
- 4.a.If the patient is not ambulatory and you feel you can move

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STANDARD OPERATING PROCEDURE

Radiation Therapy

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EMERGENCY PROCEDURES FOR RADIATION THERAPY PERSONNEL

them to a stretcher by yourself without going to the "beam side" of the table, then remove the patient from the room and do not attempt to manually shut off the source. Proceed to steps 10-11.

- 4.b. If the patient cannot be moved without someone going to the "beam side" of the table try to shut the source off before removing the patient. Follow the following steps.
5. Remove the source head front cover.
6. Pull yellow handle outwards in radial direction (Step A below).
7. Push handle toward back of source head (Step B below).
8. Rotate handle counter-clockwise in direction of green arrow as far as it can go (Step C below).
9. Lock source by rotating yellow thumb screw 90° (Step D below).
10. Press EMERGENCY POWER OFF pushbutton.
11. Notify Dr. Jones or one of the therapists and the Oklahoma City Siemens service center. Phone numbers are posted by the telephone.

If the "Radiation indicating light" indicates that the source is not "ON" but the cobalt machine indicates that the source is not in the "OFF" position (indicator light at door is red and/or console continuously beeps), proceed as follows:

1. Enter room and observe disk on source head cover. If any of the red part of the disk shows, proceed as above.
2. If only the green part of the disk shows, remove the patient from the room in a normal manner.
3. Follow steps 5-11 above.

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UP

St. John Medical Center
Gammatron source head

Position of yellow handle
when source is exposed

Step A-pull handle radially

Step B-push handle toward gantry

Step C-rotate yellow handle
in direction of green arrow

Yellow locking pin
Step D-rotate pin

Position of yellow handle
when source is completely
off

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EMERGENCY PROCEDURES FOR RADIATION THERAPY PERSONNEL

d. Employee Training

The Radiation Therapy supervisor will review the above emergency procedures with each employee at their annual evaluation. Procedures for a "Code Blues" and Radiation Emergencies will be reviewed with each employee at least one additional time during the year. Procedures for a "Condition Red" will be reviewed during fire drills.

In addition to the items listed above radiation therapy department employees will also be instructed (as appropriate for their job) by their supervisor when first hired and annually thereafter in the following

- a. Location of all radioactive material within the Department
- b. The relative biological hazards of radioactive material
- c. Additional safety procedures appropriate to their respective duties.
- d. Rules and Regulations of the NRC and condition of the license
- e. Their obligation to report unsafe conditions to their supervisor
- f. Their right to be informed of their radiation exposure.
- e. Notification of authorities following various emergencies

Notify the following in case of the emergencies listed

Malfunctioning Treatment or Simulation Machine

Notify Radiation Physicist
X-ray Service Engineer (for simple electronic problems not including Co-60 source problems)
Manufacturer or service organization

Accidental overexposure (exceeds planned dose by 10%) of patient

Notify: Radiation Therapist
Radiation Physicist
NRC and others as specified in mis-administration notebook in Physicist's office

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STANDARD OPERATING PROCEDURE

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EMERGENCY PROCEDURES FOR RADIATION THERAPY PERSONNEL

All phone numbers are posted beside the telephone.

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