

PART I-LICENSE, INSPECTION, INCIDENT/EVENT, AND ENFORCEMENT HISTORY

1. AMENDMENTS AND PROGRAM CHANGES:
(License amendments issued since last inspection, or program changes noted in the license)

<u>AMENDMENT #</u>	<u>DATE</u>	<u>SUBJECT</u>
77	3/26/08	Added the 4321 Washington Street facility

2. INSPECTION AND ENFORCEMENT HISTORY:
(Unresolved issues; previous and repeat violations; Confirmatory Action Letters; and orders)

No violations were identified during the last inspection.

3. INCIDENT/EVENT HISTORY:
(List any incidents, or events reported to NRC since the last inspection. Citing "None" indicates that regional event logs, event files, and the licensing file have no evidence of any incidents or events since the last inspection.)

None

PART II - INSPECTION DOCUMENTATION

1. ORGANIZATION AND SCOPE OF PROGRAM:
(Management organizational structure; authorized locations of use, including field offices and temporary job sites; type, quantity, and frequency of material use; staff size; delegation of authority)

Rich Hastings, CEO
Kevin Thorpe, Vice President
Dave Schemenauer, Director of Safety and Security
Greg Sackett, RSO

High dose rate (HDR) and low dose rate brachytherapy involved three dosimetrists, two authorized medical physicists, and two authorized users. The licensee used a Varian Model Varisource HDR unit for Mammosite and gynecological treatments. Low dose rate brachytherapy involved about two cesium-137 gynecological implants per week. Iodine -125 eye plaque implants were done about twice per month.

Medical Research was limited to use of Neovista units.

The full spectrum of nuclear medicine studies (excluding cardiac studies) was conducted at the main nuclear medicine department at the Wornall Road location. About 5 studies were conducted per day by two full-time nuclear medicine technologists. Technetium-99m generators were not used. The Washington Street facility involved about 10 diagnostic imaging studies per day (unit dosages only) and administration of less than

30 millicuries of I-131 twice per month conducted by two full-time nuclear medicine technologists.

The licensee had not conducted research and development studies for about five years.

The licensee planned to request an amendment to add NARM to its license before the 3/30/09 deadline.

2. SCOPE OF INSPECTION:

(Identify the inspection procedure(s) used and focus areas evaluated. If records were reviewed, indicate the type of record and time periods reviewed)

Inspection Procedure(s) Used: 87134

Focus Areas Evaluated: 03.01-03.08

3. INDEPENDENT AND CONFIRMATORY MEASUREMENTS:

(Areas surveyed, both restricted and unrestricted, and measurements made; comparison of data with licensee's results and regulations; and instrument type and calibration date)

Using a Canberra Model MRAD213, Serial 13000519, last calibrated on 11/6/08, the inspector conducted ambient exposure rate surveys in selected areas of the licensee's facilities. The inspector surveyed selected areas and noted the following results:

- a maximum of 20 microrentgen per hour at selected surfaces of the main nuclear medicine hot lab;
- a maximum of 30 microrentgen per hour at shielded surfaces of the low dose rate brachytherapy hot lab;
- a maximum of 900 microrentgen per hour at selected surfaces of the low dose rate brachytherapy safe;
- a maximum of 2.2 milliroentgen per hour at the surface of the HDR unit;
- a maximum of 0.2 milliroentgen per hour at 30 centimeters from accessible surfaces outside of two rooms, each containing patients receiving low dose rate brachytherapy treatments; and
- a maximum of 16 microrentgen per hour at selected surfaces of the Washington Street hot lab

4. VIOLATIONS, NCVs, AND OTHER SAFETY ISSUES:

(State the requirement, how and when the licensee violated the requirement, and the licensee's proposed corrective action plan. For NCVs, indicate why the violation was not cited. Attach copies of all licensee documents needed to support violations.)

- A. 10 CFR 35.41(a) states that, for any administration requiring a written directive, licensees are required to develop, implement, and maintain written procedures to provide high confidence that: (1) the patient's or human research subject's identity is verified before each administration; and (2) each administration is in accordance with the written directive. Procedures must meet the requirements described in 10 CFR 35.41(b).

Item V.7. of the licensee's written procedure to provide high confidence that each administration is in accordance with the written directive titled, "Use, Removal, Handling,

and Storage of Temporary Implant Brachytherapy Sources” states, in part, that shortly after removal of brachytherapy sources from patients, the date and time of the removal shall be recorded in the Treatment Summary section of the “Brachytherapy Treatment Record.”

In addition, Item VI.7. of the licensee’s written procedure to provide high confidence that each administration is in accordance with the written directive titled, “Therapeutic Radiopharmaceutical Administrations” states, in part, that the lower portion of the Radioiodine Therapy Written Directive form be completed after the dosage is administered to the patient. Attachment D to the procedure includes the Radioiodine Written Directive form. The lower portion of the form provides a blank for the user to include the “Administered Dosage,” and provides options for the user to circle as a means of specifying the units of the administered dosage.

Contrary to the above, the licensee did not fully implement written procedures to provide high confidence that each administration is in accordance with the written directive. Specifically, two temporary implant brachytherapy procedures associated with written directives dated March 17 and 18, 2009, were in progress during the inspection; however, the date and time of the removal of brachytherapy sources from the patients was documented before the sources were removed from the patients. In addition, the lower portion of the Radioiodine Therapy Written Directives dated December 29, 2008, January 7 and 20, 2009, February 11 and 27, 2009, and March 3 and 4, 2009, were incomplete such that the units of the administered dosages were not specified.

As short-term corrective action, the RSO planned to revise the Treatment Summary section of the Brachytherapy Treatment Record to clarify that the explant information must be recorded after the explant. The applicable NOV required a written response from the licensee.

- B. 10 CFR 35.40(b)(1) requires, in part, that the written directive contain the dosage for any administration of greater than 30 microcuries of sodium iodide I-131.

Contrary to the above, written directives for administrations of greater than 30 microcuries of sodium iodide I-131 dated February 11, 2009, and August 29, 2008, did not contain the dosage. Specifically, the written directives did not include the units of radioactivity to be administered to the patients.

As short-term corrective action, the RSO planned to revise the written directive to require that the units of radioactivity to be administered to the patients be written in by the authorized user. The applicable NOV required a written response from the licensee.

5. PERSONNEL CONTACTED:

(Identify licensee personnel contacted during the inspection, including those individuals contacted by telephone.)

- Shawn Clark, Nuclear Medicine Technologist (NMT)
- Anthony Cook, Security Seargent
- * Ed Cytacki, Medical Physicist
- Jenn Dean, R.N.
- * John Erb, Authorized Medical Physicist (AMP)
- Sarah Fitzmaurice, R.N.

- * Terry Jagow, Radiology Director
- Bama Keys, NMT
- Amy Kruger, Clinical Lab Scientist
- Jeffrey Kunin, M.D.
- Julie Meyers, NMT
- #^ Greg Sackett, Radiation Safety Officer
- * David Schemenauer, Safety and Security Director
- * Bobby Shipman, Senior Director of Operations
- * Roy Sions, Assistant Radiation Safety Officer
- George Snook, Security Officer
- Darcy St. Louis, Radiology Scheduler
- Karen Thompson, Blood Bank Manager
- David Young, Security Manager

Use the following identification symbols:

Individual(s) present at entrance meeting

* Individual(s) present at on-site, preliminary exit meeting

^ Individual(s) participating in telephonic, final exit meeting on 3/26/09

-END-



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: [REDACTED]		Hospital Number: _____	
Referring Physician: <u>Mitchell Hamburg</u>		Procedure: <u>I-131 Whole Body</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ^{131I} <input type="radio"/> _____	
Prescription: <u>5.0</u> μ Ci/ mCi (circle one)		Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131. (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors -- Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>2/11/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>2-11-09</u>	Administration Time: <u>0930</u>	Administered Dosage: <u>4.06</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>BKC</u> (Technologist)		
Person Administering Dose Signature: <u>Dama Cooper CRMT</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

24hr uptake
= 60.2%

Patient Name: <u>[REDACTED]</u>		Hospital Number: <u>[REDACTED]</u>	
Referring Physician: <u>Dr. Kuruvilla</u>		Procedure: <u>I131 Thyroid Therapy</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>15.0</u> μ Ci/ mCi (circle one)	Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____	
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission , Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors – Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days <input type="radio"/> Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>8-29-08</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>8-29-08</u>	Administration Time: <u>1325</u>	Administered Dosage: <u>15.5</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>Julie G. Meyers</u> (Technologist)		
Person Administering Dose Signature: <u>Julie G. Meyers</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[REDACTED]</u>		Hospital Number: <u>[REDACTED]</u>	
Referring Physician: <u>Dr. Anita Kuruvilla</u>		Procedure: <u>I131 Thyroid Therapy</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>12.0</u> <input type="radio"/> μ Ci <input checked="" type="radio"/> mCi (circle one)	Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____	
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors - Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>3/4/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>3-4-09</u>	Administration Time: <u>0915</u>	Administered Dosage: <u>11.75</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient: <u>Julie C. Meyers</u> (Technologist)		
Person Administering Dose Signature: <u>Julie C. Meyers</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[REDACTED]</u>		Hospital Number: <u>[REDACTED]</u>	
Referring Physician: <u>Mitchell Hamburg</u>		Procedure: <u>I131 Whole Body</u>	
Patient Status: <input type="radio"/> Intact Thyroid <input checked="" type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>5.0</u> <input checked="" type="radio"/> μ Ci / <input type="radio"/> mCi (circle one)	Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____	
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors – Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>3/3/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>3-4-09</u>	Administration Time: <u>0700</u>	Administered Dosage: <u>4.60</u> μ Ci / mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>Julie A. Meyers</u> (Technologist)		
Person Administering Dose Signature: <u>Julie A. Meyers</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[Redacted]</u>		Hospital Number: _____	
Referring Physician: <u>Mitchell Hamburg</u>		Procedure: <u>I-131 Whole Body</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>5.0</u> μ Ci/ mCi (circle one)		Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131. (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors -- Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>2/11/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>2-11-09</u>	Administration Time: <u>0930</u>	Administered Dosage: <u>4.06</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>BKC</u> (Technologist)		
Person Administering Dose Signature: <u>Dama Cooper CSMT</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>BARBARA [REDACTED]</u> DOB: <u>[REDACTED]</u>		Hospital Number: <u>[REDACTED]</u>	
Referring Physician: <u>Lamont Weide, MD</u>		Procedure: <u>I-131 Therapy</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>25</u> μ Ci/ <u>mCi</u> (circle one)		Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors – Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days <input type="radio"/> Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>2/27/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

NEG. HCG Preg. 2/27/09

Administration Date: <u>3-2-09</u>	Administration Time: <u>1100</u>	Administered Dosage: <u>24.9</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>BKC</u> (Technologist)		
Person Adminstrating Dose Signature: <u>BKC</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[Redacted]</u>		Hospital Number: <u>[Redacted]</u>	
Referring Physician: <u>Dr. Kuruvilla</u>		Procedure: <u>I131 Whole Body Scan</u>	
Patient Status: <input type="radio"/> Intact Thyroid <input checked="" type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>5.0</u> μ Ci/ <u>mCi</u> (circle one)		Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors – Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>1/20/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input checked="" type="radio"/> Check SSN <u>476-08-3379</u>
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>1-21-09</u>	Administration Time: <u>1515</u>	Administered Dosage: <u>4.57</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>BKC</u> (Technologist)		
Person Administering Dose Signature: <u>Bama Cooper</u>		



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[Redacted]</u>		Hospital Number: <u>[Redacted]</u>	
Referring Physician: <u>Dr. Blue</u>		Procedure: <u>I-131 Thyroid Therapy</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>12.0</u> μ Ci/ mCi (circle one)	Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____	
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors - Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>1/7/09</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>1/7/09</u>	Administration Time: <u>1010</u>	Administered Dosage: <u>11.9</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. <u>BAC</u> (Technologist)		
Person Administering Dose Signature: <u>[Signature]</u>		

Dr. Chesis



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: <u>[REDACTED]</u>		Hospital Number: <u>[REDACTED]</u>	
Referring Physician: <u>Babar Chudra</u>		Procedure: <u>I131 Therapy</u>	
Patient Status: <input checked="" type="radio"/> Intact Thyroid <input type="radio"/> Post Thyroidectomy		Radiopharmaceutical: <input checked="" type="radio"/> Na ¹³¹ I <input type="radio"/> _____	
Prescription: <u>16.0</u> μ Ci/mCi (circle one)	Form: <input checked="" type="radio"/> Gel Capsule <input type="radio"/> Liquid	Route: <input checked="" type="radio"/> Oral <input type="radio"/> _____	
Patient Admission / Isolation Orders			
<input checked="" type="radio"/> No Admission, Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="radio"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="radio"/> No Admission (Other Patient-Specific Factors - Document on Back) <input type="radio"/> Admit, Release after Dose Rate < 7 mR/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="radio"/> Admit for _____ Days Other: _____			
Authorized User Signature: <u>[Signature]</u>		Date: <u>12/29/08</u>	

Verification of Patient Identification (Check Two Methods Used)			
<input checked="" type="radio"/> Ask Name	<input checked="" type="radio"/> Check Birth Date	<input type="radio"/> Check Address	<input type="radio"/> Check SSN
<input type="radio"/> Check Signature	<input type="radio"/> Check ID Bracelet	<input type="radio"/> Check ID Card	<input type="radio"/> Check Insurance Card

Administration Date: <u>12-30-08</u>	Administration Time: <u>0830</u>	Administered Dosage: <u>15.41</u> μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient.		
Person Administering Dose Signature: <u>Julie A Meyer</u> (Technologist)		



Therapeutic Radiopharmaceutical Administrations (I-131)

Saint Luke's Health System

I. Purpose

This procedure establishes requirements providing high confidence that therapeutic radiopharmaceutical administrations are performed in a safe and accurate manner at the Saint Luke's Health System Nuclear Medicine Departments.

II. Scope

This procedure applies to therapeutic radiopharmaceutical administrations of Sodium Iodide I-131 at Saint Luke's Health System. This procedure does not apply to iodinated radiopharmaceuticals other than sodium iodide (e.g., orthoiodohippuran) nor to sodium iodide administrations less than 30 μCi (e.g., amounts normally used for thyroid uptake measurements).

III. References

- A. NRC Radioactive Materials License No. 24-00889-01;
- B. NRC NUREG-1556, Vol 9, Consolidated Guidance About Materials Licenses.

IV. Authorized Personnel

Personnel authorized to participate in therapeutic radiopharmaceutical administrations must meet at least one of the following requirements:

- A. Nuclear medicine physicians who are approved by the NRC for therapeutic use of unsealed byproduct material at Saint Luke's Health System or who have received equivalent review and approval by the Radiation Safety Committee;
- B. Board Certified Nuclear Medicine Technologist; and/or
- C. NRC-qualified Radiation Safety Officer (RSO).

Individuals not meeting these requirements must submit their qualifications to the RSC for review. Such persons may not participate in therapeutic radiopharmaceutical administrations until RSC approval.

V. Temporary Inpatient Isolation Determination

- A. I-131 Sodium Iodide
 1. A patient-specific calculation will be performed to determine the maximum likely dose to a non-treated individual. **Attachment A** calculates the administration doses where temporary inpatient isolation must be provided.
 2. Review the dose prescription against the following Table. Patients with dosages exceeding these limits are to be treated via temporary inpatient isolation.



Therapeutic Radiopharmaceutical Administrations (I-131)

Saint Luke's Health System

Maximum Outpatient I-131 Sodium Iodide Dosages

Medical Condition	Maximum Outpatient Dosage (mCi)
Hyperthyroidism (intact thyroid)	55
Thyroid Carcinoma (post thyroidectomy)	200

3. Contact and interview the patient via telephone. The Radioiodine Therapy Patient Interview Form (**Attachment B**) specifies the information to be requested. Notify the Nuclear Medicine department if the criteria can not be met.

VI. Dose Administration

A. I-131 Sodium Iodide

1. The nuclear medicine physician will explain the procedure, expected benefits and possible complications to the patient (**Attachment C**).
2. Review the Radioiodine therapy Written Directive for completeness (**Attachment D**). Contact the signatory if the orders are unclear or if you are unfamiliar with them.
3. Review the dosage provided by the radiopharmacy against the written directive specifications:
 - a. Verify correct patient name;
 - b. Verify correct radiopharmaceutical
 - c. Measure and verify dosage within 10% of the prescribed dose;
 - d. Verify correct route of administration;
 - e. Verify treatment date; and
 - f. Verify expiration date has not been exceeded.
4. Verify the patient identification by at least two methods. Document the methods used.
5. Do not proceed without further instruction from the signatory in the event of any deviations from the written directive.
6. Prior to administration, have patient drink at least 250 ml of water.
7. Administer the dosage as directed. Complete the lower portion of the Radioiodine Therapy Written Directive form.
8. Prior to discharge, make sure that patient has been provided both written instructions (**Attachment E**) for radiation exposure reduction and understands these instructions. Ensure that acknowledgement of instructions receipt is documented (**Attachment F**).



Therapeutic Radiopharmaceutical Administrations (I-131) Saint Luke's Health System

9. All waste materials (e.g., capsule vials) will be bagged, labeled and returned to the radiopharmacy.
10. Thyroid counts (bioassay) are required for authorized personnel involved in liquid (non-capsule) radioiodine administrations > 10 mCi, or for technicians who perform decontamination of isolation rooms. The bioassay must be performed within 3 days of the administration and documented.

VII. Inpatient Isolation

- A. I-131 Sodium Iodide
 1. Notify house supervisor for room assignment of scheduled procedure to ensure that appropriately trained personnel are available.
 2. Prepare patient room for contamination controls as directed on the Temporary Patient Isolation Checklist (**Attachment H**).
 3. Post Nursing instructions (**Attachment G**) and RAM postings on patient room door or in patient chart.
 4. The patient may be released from temporary isolation once radiation levels (measured using ion chamber) have fallen below 7 mrem/h at 1-meter from the patient's umbilicus. Document the measurement on the Temporary Patient Isolation Checklist.
 5. Prior to discharge, make sure that patient has been provided both written instructions (**Attachment E**) for radiation exposure reduction and understands these instructions. Ensure that acknowledgement of instructions receipt is documented (**Attachment F**).
 6. Following patient discharge, decontaminate the room as directed on the Temporary Patient Isolation Checklist.
 7. Decontaminate room as necessary to meet room release guidelines.
 8. All contaminated items will be kept in an approved storage location and held for radioactive decay.
 9. Notify nursing when patient room is available for general hospital use.

VIII. Patient Follow-Up

The referring physician will normally be following therapeutic radiopharmaceutical patients.

IX. Record Requirements

- A. All records generated by this procedure will be maintained for at least 3 years. Documentation regarding medical events will be maintained for at least 5 years.
- B. Documents that are to be discarded will be transferred to the RSO for disposal.



**Therapeutic Radiopharmaceutical Administrations
(I-131)**
Saint Luke's Health System

X. Attachments

- A. Patient-Specific Calculations for Temporary Inpatient Isolation Requirements
- B. Radioiodine Therapy Patient Interview
- C. Radioiodine Therapy Patient Information
- D. Radioiodine Therapy Written Directive / Record of Release
- E. Radioiodine Patient Instructions
- F. Acknowledgement of Patient Instructions Receipt
- G. Nursing Instructions for I-131 Therapy Patients
- H. Temporary Patient Isolation Checklist

Attachment A

Patient-Specific Calculations for Temporary Inpatient Isolation Requirements

Purpose

The purpose of this calculation is to determine the maximum likely dose to a non-treated individual. Temporary inpatient isolation is required for any radioiodine administration determined to result in a likely total dose to a non-treated individual of 500 mrem or greater.

References

A. NRC NUREG 1556, Vol 9, Consolidated Guidance About Materials Licenses.

Methodology

1. The following equation will be used to estimate the maximum likely total dose to a non-treated individual (Equation U.2, Ref. A):

$$D_{\infty} = \frac{34.6 \Gamma Q_0}{(100 \text{ cm})^2} \left\{ E_1 T_p (0.8) \left(1 - e^{-0.694(0.33)/T_p} \right) + e^{-0.694(0.33)/T_p} E_2 F_1 T_{1\text{eff}} + e^{-0.694(0.33)/T_p} E_2 F_2 T_{2\text{eff}} \right\}$$

2. The variables for the previous equation are as follows:

D_{∞} - Maximal total dose to untreated individual

Γ - Exposure rate constant for I-131 point source; 2.2 R/mCi-h at 1-cm (**Table U.5, Ref A.**)

Q_0 - Initial activity of I-131 administered

E_1 - Occupancy Factor for times less than 8 hours; 0.75 (**Appendix B-1, Ref A**)

E_2 - Occupancy Factor for times greater than 8 hours to total decay, 0.25 (**Appendix U, Ref A**)

T_p - Physical half-life for I-131; 8.04 days (**Table U.5, Ref A.**)

F_1 and F_2 - Uptake fraction for extrathyroidal and thyroidal components, respectively (**see Table U.6**)

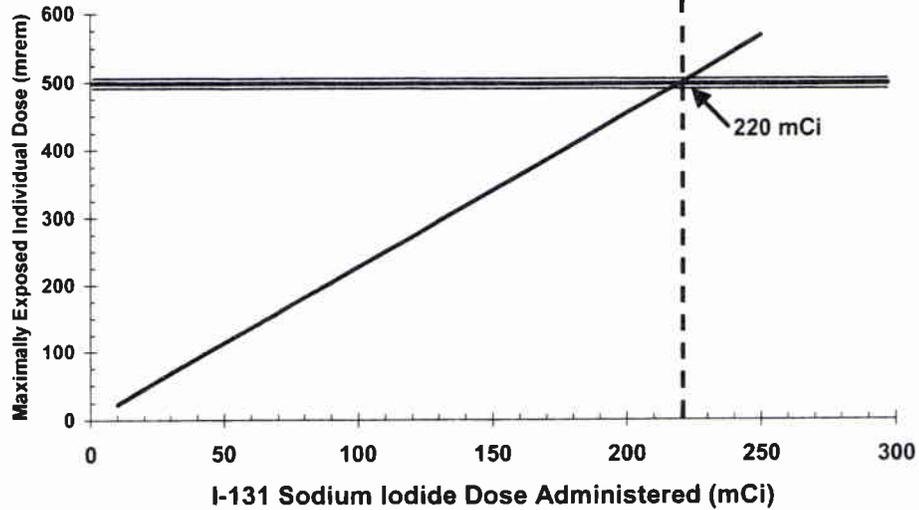
$T_{1\text{eff}}$ and $T_{2\text{eff}}$ - Effective half-life for extrathyroidal and thyroidal components, respectively (**see Table U.6**)

3. The patient will be interviewed to ensure that the delineated variables are appropriate for use in this calculation.

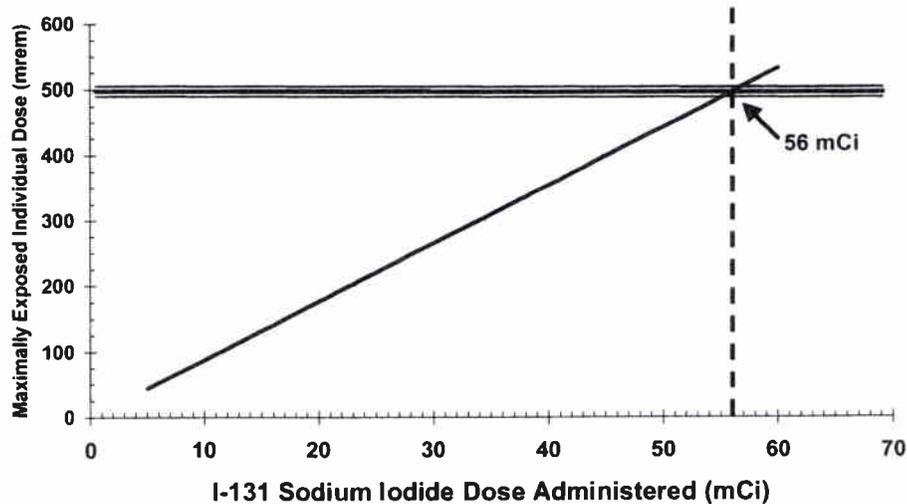
4. Setting D_{∞} to be 500 mrem, the radioiodine administration, Q_0 , that must not be exceeded without inpatient isolation is calculated. Figure 1 illustrates the D_{∞} calculated using this methodology for patients treated for Hyperthyroidism. Figure 2 illustrates the D_{∞} calculated using this methodology for patients treated for thyroid carcinoma post thyroidectomy.

Attachment A

**Figure 1: Maximally Exposed Individual Dose Calculation
Post Thyroidectomy Administration**



**Figure 2: Maximally Exposed Individual Dose Calculation
Thyroid Ablation (Intact Thyroid)**



5. Based on the delineated Patient-Specific Calculations, Table 2 provides the maximum I-131 sodium iodide doses that may be administered as an outpatient procedure.

Table 2: Maximum Outpatient I-131 Sodium Iodide Dosages

Medical Condition	Maximum Outpatient Dosage (mCi)
Hyperthyroidism (intact thyroid)	55
Thyroid Carcinoma (post thyroidectomy)	200

Attachment C
Radioiodine Therapy Patient Information
Nuclear Medicine Department
Saint Luke's Health System

Your physician has referred you for a treatment of radioactive iodine for either treatment of a hyperactive thyroid or ablation of residual functioning thyroid tissue. Other methods of therapy may be available, but this particular treatment is felt to be best in your situation at this time.

We are attempting to either suppress or destroy all functioning thyroid tissue. Results are not always successful. There is a chance that the treatment will not be completely successful. In the event of such an outcome, an additional treatment or treatments may be necessary.

There are two major complications. First, there is an approximately 1% chance of developing leukemia, a cancer of the blood; the chances vary with the cumulative dose of radioactive iodine. Second, there is an approximate 1% chance of developing significant bone marrow depression. If this occurs, blood transfusions may be necessary. However, the bone marrow would be expected to recover.

There are several relatively minor, self-limited, side effects that may occur. First, there is a chance that the treatment may cause nausea and vomiting for several days. Second, there is a chance that the treatment may injure your salivary glands resulting in soreness and dryness of the mouth for several days. Stimulating salivation (e.g., sucking on hard candies) may mitigate these symptoms. Third, there is an approximately 20% chance of neck swelling and pain. If any of these complications occur, you may contact your physician for symptomatic treatment.

You should refrain from eating for 30 minutes following ingestion of the radioactive iodine. Patients should avoid becoming pregnant for 6 months. Female patients who are pregnant or who are planning to breast-feed should not undergo this procedure.

Serum Pregnancy Test Results			
Date Taken: _____		OR Not Applicable	
Result: Negative	Positive		
Is the patient breast-feeding?	YES	NO	

Patient or Legal Guardian

Physician

Witness

Date

Attachment B



Radioiodine Therapy Patient Interview

Patient Name: _____ ID# _____

Date: _____

Patient Status: Intact Thyroid (I) Post Thyroidectomy (T)

Dose (mCi): _____

Date of latest pregnancy test: _____ (Serum Beta HCG)

Patient pregnancy test negative and patient is not pregnant? Yes No

Patient will not be breast feeding after administration? Yes No

Patient has not had prior iodine therapy in the current year? Yes No

The patient does not have any medical condition that will interfere with normal renal function or urinary/fecal incontinent? Yes No

For the duration immediately following administration:

Can you maintain a distance of at least 3 feet from others for at least 2 days? Yes No

Can you sleep alone in a room for at least 2 nights? Yes No

Will you avoid travel by plane or mass transportation during the first 2 days after therapy? Yes No

Will you avoid travel by car with anyone else for more than a 5-hour trip during the first 2 days after therapy? Yes No

Will you be able to use a bathroom without sharing with others for the first 2 days after therapy, or have instructions been given to the patient in regards to practicing good hygiene and flushing the toilet 2 times? Yes No

Will you be able to drink a cup of fluid every 4 hours for the first 2 days after therapy? Yes No

Reschedule procedure or patient isolation should be considered if any answers are "NO"

- Patient qualifies for Outpatient Procedure
- Patient should be admitted for Patient Isolation
- Patient voluntarily wishes to be admitted for Patient Isolation

Signature of Interviewer: _____

Attachment D



Saint Luke's Health System

Radioiodine Written Directive / Record of Release

Patient Name: _____		Hospital Number: _____
Referring Physician: _____	Procedure: _____	
Patient Status: <input type="checkbox"/> Intact Thyroid <input type="checkbox"/> Post Thyroidectomy	Radiopharmaceutical: <input type="checkbox"/> Na ¹³¹ I <input type="checkbox"/> _____	
Prescription: _____ μ Ci/ mCi (circle one)	Form: <input type="checkbox"/> Gel Capsule <input type="checkbox"/> Liquid	Route: <input type="checkbox"/> Oral <input type="checkbox"/> _____
Patient Admission / Isolation Orders		
<input type="checkbox"/> No Admission , Dose < 33 mCi I-131 (NUREG 1556, Vol 9, Table U1, Column 1) <input type="checkbox"/> No Admission, Dose < 55 mCi for Intact Thyroid Patient, or Dose < 200 mCi for Post Thyroidectomy Patient. (Patient-Specific Factors per NUREG 1556, Vol 9, Appendix U, E=0.25) <input type="checkbox"/> No Admission (Other Patient-Specific Factors – Document on Back) <input type="checkbox"/> Admit, Release after Dose Rate < 7 mrem/hr at 1-meter (NUREG 1556, Vol 9, Table U1, Column 2) <input type="checkbox"/> Admit for _____ Days <input type="checkbox"/> Other: _____		
Patient Instruction Required for: (I-131: Activity > 7 mCi; Dose Rate @ 1 meter > 2mrem/hr)		
Authorized User Signature: _____	Date: _____	

Verification of Patient Identification (Check Two Methods Used)			
<input type="checkbox"/> Ask Name	<input type="checkbox"/> Check Birth Date	<input type="checkbox"/> Check Address	<input type="checkbox"/> Check SSN
<input type="checkbox"/> Check Signature	<input type="checkbox"/> Check ID Bracelet	<input type="checkbox"/> Check ID Card	<input type="checkbox"/> Check Insurance Card

Administration Date: _____	Administration Time: _____	Administered Dosage: _____ μ Ci/ mCi (circle one)
The Administered Dosage, Radiopharmaceutical, Form, and Route per prescription above. Patient procedures and radiation safety precautions explained to patient. _____ (Technologist)		
Person Administering Dose Signature: _____		

Attachment E

THIS INFORMATION IS FOR YOU BECAUSE YOU WILL BE TREATED WITH RADIOIODINE, A RADIOACTIVE FORM OF IODINE.

It includes special instructions for you to follow when you go home after treatment.

Why will you receive radioiodine treatment?

You will receive radioiodine because you and your doctor have agreed to it as the most appropriate treatment for your thyroid condition. Most of the radiation from the radioiodine will be absorbed by your thyroid gland and will interfere with the function of the thyroid cells. This is the desired and beneficial medical effect of the treatment. However, some of the radiation will leave your body, and individuals who are in close physical contact with you may be exposed to small amounts. There is no evidence that such exposure has ever caused any harm. Nevertheless, efforts should always be made to avoid unnecessary exposure to radiation.



Ask your doctor

The best source of additional information on your treatment is your doctor. This pamphlet provides some guidelines for you to follow for a short time immediately after your treatment, (usually no more than 2 to 5 days, depending on your treatment and your doctor's instructions). The guidelines offer steps you can take to reduce radiation exposure to others after your treatment. However, you may decide, or your personal situation may require, that you will want to follow all or only some of the suggested guidelines. Remember, these are only suggestions to help you make more informed decisions as you discuss your questions and concerns with your doctor.

How does radioiodine work?

The thyroid gland accumulates the iodine that enters the body in food and uses this iodine to perform its normal function, which is to make thyroid hormone. Radioiodine is similarly collected by the thyroid gland. The radiation given off by this form of iodine decreases the function of the thyroid cells and inhibits their ability to grow. This is the desired medical effect and the reason you will be given this medication. Radioiodine treatment is a common, well-accepted form of treatment that has been used all over the world for more than 30 years.

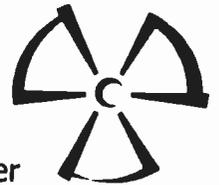
Most of the radiation from the radioiodine will be received by your thyroid gland. However, the other tissues in your body will receive some incidental radiation. This small amount of radiation has not been shown to produce any adverse effect.

Attachment E

How long does the radioiodine stay in your body?

The radioiodine from your treatment will remain in your body only temporarily. Most of the radioiodine not collected by your thyroid gland will be eliminated during the first two days after your treatment. Radioiodine leaves your body primarily in your urine, but very small amounts may live in your saliva, sweat and feces. The amount of radioiodine remaining in your thyroid tissue is responsible for the desired medical effect. However, this amount also decreases rapidly. This means that the possibility of radiation exposure to you and others are reduced with time. At the end of treatment, no radioiodine remains in your body.

How can others be exposed to radiation from the radioiodine given to you?



Exposure to radiation from the radioiodine in your body may occur if other people remain very close to you for long periods of time. The radiation received is very similar to the radiation from medical and dental x-rays, which are the most common and familiar sources of external radiation exposure. Monitors that may be present in certain public buildings can detect the radiation emitted from your body. To show that you have been treated for a medical condition, you should keep the therapy bracelet given to you (wear it for the first several days and then keep it in your purse or wallet for 2 weeks).

Contamination with radioiodine can occur if it is deposited in any place where other people may have contact with it. For instance, if some of the radioiodine in your saliva gets on the bathroom sink as you brush your teeth, and onto someone's hands, contamination has occurred. If radioiodine is then taken into someone's body from their hands or from food that has been touched, it will cause a small amount of radiation exposure to that person.

Radioiodine disappears by itself as part of the physical processes that make it radioactive. For example, it will not remain in the sink indefinitely because its quantity is reduced by one-half every eight days. This is what is meant when it is said that the "half-life" of the radionuclide is eight days.

How can you reduce radiation exposure to others?



The amount of radioiodine in your body during the treatment is small. Although there is no evidence that the radiation from this amount of radioiodine will cause any problem, it makes sense to take steps to minimize exposure, no matter how small. If you take some simple precautions during the first few days after your treatment (as explained below), you can reduce or eliminate the possibility of radiation exposure to others.

Attachment E

INSTRUCTIONS FOR PATIENTS TAKING RADIOIODINE THERAPY

1. No solid foods for two hours after swallowing the radioiodine; you can drink fluids at any time.
 2. Drink plenty of fluids for at least the first two days (so that you can urinate frequently).
 3. Empty your bladder frequently (at least once every 2 hours during the day).
 4. Have sole use of a bathroom for at least two days, if possible.
 5. Flush the toilet two times after each time you urinate, for 48 hours.
 6. Maintain a prudent distance from others for at least the first two days. If a small child is in the home, limit close contact, other than that required for the child's care.
 7. Sleep alone in a room for at least two nights.
 8. Do not travel by airplane or mass transportation for at least two days.
 9. Do not travel on a prolonged automobile trip (more than 5 hours) with others for at least the first two days.
 10. If you develop soreness or swelling in the salivary glands, contact the Nuclear Medicine physician.
-

Attachment E

There are three basic principles to remember:

Distance. The greater the distance you are from others, the less radiation they will receive. Even an increase in distance of a few feet will greatly reduce the exposure. So try not to remain in close contact with others for longer than necessary.

Time. Radiation exposure to others depends on how long you remain close to them. You should try to minimize the time spent in close contact with others.

Hygiene. Good hygiene minimizes the possibility that other people will be contaminated with the radioiodine that leaves your body. Since most of the radioiodine leaves your body in your urine, good toilet hygiene and careful and thorough washing of your hands will reduce the possibility of contamination.

Your doctor can best recommend which guidelines are important for you and how long you should follow them. Do not hesitate to ask your doctor for more information.



Attachment F

**Saint Luke's Health System
Radiology Department**

Date: _____

I, _____, have received full written instructions on precautions I need to follow to minimize radiation exposure to others. I understand that I should follow these instructions for 7 days after my therapeutic radiopharmaceutical treatment. All of my questions have been fully answered and explained to me.

Patient or Legal Guardian Signature

Witness Signature

Attachment H



Temporary Patient Isolation Checklist Saint Luke's Health System

Patient Name: _____ Room #: _____

Pre-Treatment Room Preparation

- ___ Mattress has plastic cover. Pillow has plastic cover and/ or is disposable
- ___ Floor and other surfaces are covered with absorbent pads with impervious backing or plastic.
- ___ Trash and linen containers are present in patient room
- ___ Patient is wearing hospital gown and robe prior to administration
- ___ Surgical gloves and booties are available for nursing staff use
- ___ Radioactive warning signs and emergency contact information are posted outside of patient's door
- ___ Radiation precautions (nursing Instructions for I-131 therapy Patients) are provided to nursing staff or posted
- ___ Private room and private facilities assigned.

Patient Radiation Survey				
Survey Meter Make and Model:			Serial Number:	
Date	Time	Distance	Dose Rate	Name
		1 meter		

Patient Release Record

Patient Radiation Measurement: _____ mrem/hr at 1-meter from umbilicus

Radiation survey of the patient is less than 7 mrem/hr for I-131;
therefore the patient is released from radiation safety precautions.

Signature: _____ Date: _____ Time: _____

Room Decontamination

- ___ Potentially contaminated items are contained and removed from room.
- ___ Radiation contamination survey performed. All areas decontaminated below 200 DPM/100 cm² or RSO notification.
- ___ All contaminated items are placed in an approved storage location for decay-in-storage disposal.

Date of Room Release: _____ Tech Name: _____

Bioassay for Personnel Involved in I-131 Dose Administrations

(Note: Bioassays must be performed within three days of I-131 administration)

Date of Administration: _____

Bioassay Date: _____ Name: _____ I-131 Burden: _____ μ Ci

Bioassay Date: _____ Name: _____ I-131 Burden: _____ μ Ci

Notify the Nuclear Medicine Supervisor and Radiation Safety Officer if burden > 0.04 μ Ci

Attachment G

Nursing Instructions for I-131 Therapy Patients

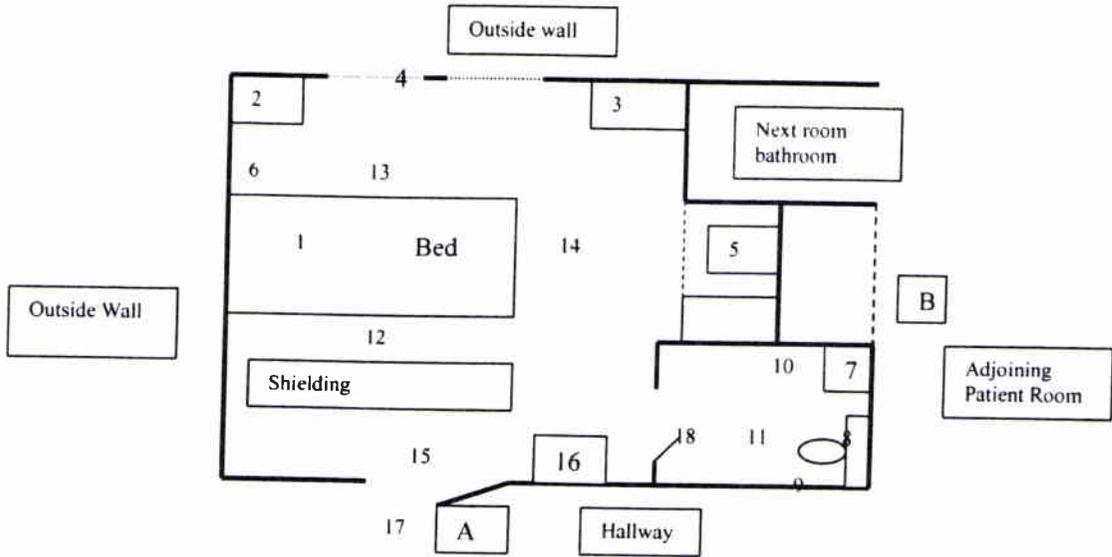
Therapeutic procedures utilizing I-131 have been proven to be effective in the treatment of various endocrine diseases. This treatment presents no problem to hospital personnel provided that the proper precautions are taken. These are:

1. Similar to infectious disease, isolation techniques should be observed. The problems of radioactive iodine contamination are similar to those of bacterial contamination although the use of a mask and disinfectant solutions is not effective.
 - Minimize contact with the patient and insure proper protective apparel is used.
 - Minimize the stay-time in the treatment room.
2. Wear your assigned dosimeter while on duty. This will allow radiation exposure to be recorded. If you do not have a dosimeter, obtain one by contacting your supervisor or the Radiation Safety Officer at (816) 932-6296.
3. An **ISOLATION CART**, containing shoe covers, gowns, gloves and etc. should remain outside of the room until the patient is released and the room has been decontaminated and released for unrestricted use by the Radiation Safety Officer or their designee.
4. **ALL PERSONS** entering this room shall wear disposable gowns, gloves and shoe covers then place them in the provided containers before leaving room. Any items which come into contact with the patient should be considered contaminated and should be left in the room to be surveyed prior to removal from the room. These items include bed linens, equipment, bedpans and the like.
5. Disposable trays and utensils shall be used and placed in the waste container after use.
6. Minimize your radiation exposure by limiting your stay in the immediate vicinity of the patient to that necessary to perform your duties.
7. **NO VISITORS** will be permitted during the patient stay without prior permission from the Radiation Safety Officer through the attending physician.
8. The Radiation Safety Officer or designee shall be notified immediately if the patient dies or has a medical emergency.

By observing these precautions, radioactive iodine therapy may be accomplished without exposing hospital personnel or visitors to unnecessary risks.

I-131 Therapy Area Survey Form

Patient Information		
Patient Name: _____	Date Admitted: _____	Room #: _____



Post Administration Contiguous Area Survey

Area surveyed	Results (mR/hr)
A) Hallway by door	
B) Adjoining room	
C)	
Background (post injection)	

All contiguous area surveys are less than 2 mR/hr.

Survey Meter (Make and Model): _____ Serial Number: _____

Signature: _____ Date: _____ Time: _____

Final survey and wipe locations

1 - Bed rails and mattress	11 - Floor in front of toilet
2 - Night Stand	12 - Floor next to bed door side
3 - Chair	13 - Floor next to bed window side
4 - Windowsill	14 - Floor in front of bed
5 - Television	15 - Floor at doorway
6 - TV Remote/ Call Button	16 - Food Tray
7 - Sink	17 - Door Knob room
8 - Toilet	18 - Door knob bathroom
9 - Assist Bar	19 -
10 - Floor in front of sink	20 -

I-131 Therapy Area Survey Form

$dpm = cpm \times (\text{efficiency correction factor})$

Efficiency correction factor = _____

Final survey and wipe locations

Survey and wipe Location	Survey meter results	Wipe counts (cpm)	Net Wipe counts (cpm)	Wipe counts (dpm)
Background				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Survey Meter Information:

Survey meter make and model: _____
 Survey meter serial number: _____
 Probe make and model: _____
 Probe serial number: _____

Wipe Results:

Instrument make and model: _____
 Instrument serial number: _____
 Count time: 1 minute Window: _____

This is to certify that the facility identified above has been surveyed for radiological hazards. A contamination check was performed with a portable instrument, and a wipe survey was performed to assess potential removable contamination in this facility. The areas surveyed with the portable meter were found to be less than or equal to background and removable contamination was found to be less than 200 dpm/100cm². All radiological hazards and postings have been removed from this area, and the facility may be released for unrestricted use.

Signature: _____ Date: _____ Time: _____

RESTRICTED AREA

DO NOT ENTER

Affix Yellow
"Caution Radioactive Material Sign"
Here

In Case of Medical Emergency Call: _____
Doctor's Name Pager Number Phone Number

In Case of Radiological Emergency Call:
Radiation Safety: Office (816) 932-6296; Cell (816) 665-9062
Nuclear Medicine: Office (816) 932-2574

Use, Removal, Handling, and Storage of Temporary Implant Brachytherapy Sources

I. Purpose

This procedure establishes requirements that provide high confidence that the patient's identity is verified before each administration and each administration is in accordance with the written directive. This procedure also establishes guidelines by which the use, removal, handling, and storage of low dose brachytherapy sources may be accomplished in a safe manner.

II. Scope

This procedure applies to all therapeutic administrations at Saint Luke's Health System of low dose brachytherapy sources under 10CFR 35.400.

III References

- a. NRC Radioactive Materials License No. 24-00889-01;
- b. Title 10 of the Code of Federal Regulations, Part 35.40, "Written directives", Part 35.41, "Procedures for administrations requiring a written directive"; and
- c. NRC NUREG-1556, Vol 9, Consolidated Guidance About Materials Licenses.

IV. Authorized Personnel

Personnel authorized to handle low dose brachytherapy sources must meet at least one of the following requirement.

The clinical use of brachytherapy sources is limited to the Radiation Oncologist whose training and experience support the granting of such privilege. The safe use, removal, handling, and accountability of all brachytherapy sources are the joint responsibility of the Radiation Oncologist and the Radiation Physicist. The following guidelines are provided.

1. The clinical use of brachytherapy sources is limited to Authorized User who are approved by the NRC or who have received equivalent review and approval by the Radiation Safety Committee.
2. All personnel authorized to remove, handle, and oversee storage of brachytherapy sources shall be reviewed by the Radiation Safety Officer.
3. Subject to Item 2, the following categories of personnel are allowed to remove, handle and oversee the storage of brachytherapy sources:
 - a. NRC qualified user physician or equivalent
 - b. NRC qualified physicist and/or RSO or equivalent
 - c. Certified medical radiation dosimetrist.

V. Policy

1. Written Directive

Prior to initiating radiation delivery using brachytherapy sources, a written directive shall be signed and dated by an Authorized User and include treatment site, radionuclide, and prescribed dose. [*Written Directive for Low Dose Rate Brachytherapy or Written Directive for Eye Plaque*]

The Authorized User must be approved to administer radiation to patients and shall be approved by the Radiation Safety Committee. This treatment directive will be written for a specific patient.

If, in the authorized user's opinion, the patient may be harmed by delayed treatment, treatment may proceed on the basis of:

- a) an *oral directive*, if documented immediately in the patient's record and a written directive is prepared within 48 hours of the oral directive;

- b) an *oral modification to a written directive*, if documented immediately in the patient's record and a revised written directive is signed and dated by an authorized user within 48 hours of the oral directive.

A written modification to an existing written directive may be made provided the revision is dated and signed by an authorized user prior to completion of the existing brachytherapy dose prescription.

2. Verification of Patient Identity

Before administering the prescribed radiotherapy dose, the patient's identity will be verified by 2 methods as the individual named on the written directive. Example of patient identity verification includes but not limited to examining patient's ID bracelet, hospital ID card, driver's license, social security card, or photo-identification.

3. Verification of Written Directive by Administering Physician/Physicist/Nuclear Medicine Tech

The authorized user must verify, before administering (afterloading) the prescribed radiotherapy dose, that the details of the administration (afterloading) are in accordance with the written directive.

4. Seek Guidance

All personnel involved in delivery of the brachytherapy dose shall seek guidance if they do not understand how to carry out the written directive. Workers having any question or confusion about specific details of the treatment shall not administer the dosage until the question is resolved.

5. Verification of Source Position

Source positions shall be verified for all implants. If possible, dummy sources shall be used. Source position may be verified using orthogonal radiographs, CT, or other imaging modality. In the case of fixed geometry applicators (i.e. Burnett), patient specific imaging is not necessary provided that suitable position information has been previously obtained. The type of position verification used shall be recorded on the "*Brachytherapy Treatment Record*".

Eye Plaque source position is confirmed visually during surgical implant.

6. Source Loading Sequence Verification

Upon removing sources from the safe the "Applied Distribution" box of the "*Written Directive for Low Dose Rate Brachytherapy*" shall be filled out, including location, source strength and color code of each source. The person removing the sources shall confirm that the applied distribution agrees with the planned distribution.

After sources are loaded or inserted in the patient, but prior to completion of the treatment, the physician shall note the treatment site, number of sources implanted, the prescribed dwell time, and total source strength in the written directive.

7. Recording Time and Dose Delivered

Shortly after implantation and removal the date and time of implantation and removal shall be recorded in the Treatment Summary section of "*Brachytherapy Treatment Record*" or "Eye Plaque Surgical Room Survey and/or Release Record" respectively. After completion of treatment the total dose delivered will be calculated and recorded as well.

8. Dose Calculation Check

Before the brachytherapy treatment, the authorized user or another qualified individual (preferably a person who did not perform the original calculations) shall check the dose calculations. Calculations should be checked for arithmetic errors, accurate transcription and use of all dosimetry data, and the proper use of nomograms and formulas. Computer calculations may also be checked by manually calculating dose to one key point. Additionally, all treatment planning systems must be thoroughly acceptance tested before using with patients.

9. Storage of Brachytherapy Sources

When not in use the sealed source will be stored in a specially designed space in the Radiation Therapy Hot Lab.

Cs-137 brachytherapy sources will be stored in a lead lined safe in Radiation Therapy Hot Lab. Ir-192 ribbons will be stored in their original shipping container awaiting return shipment. I-125 or Pd-103 seeds will be stored in a lead lined container awaiting return shipment or decay-in-storage disposal. The Hot Lab room will be locked at all times. Only authorized users and qualified personnel will have access to Hot Lab.

The appropriate log book must be filled out when radioactive sources are received, removed for use, returned from use, placed in decay-in-storage, or returned to the supplier. "Cs-137 Source Use Log", "Ir-192 Seed Source Use Log", "I-125 Seed Source Use Log" or "Pd-103 Seed Source Use Log".

10. Special Precautions to be used when handling Sealed Sources

Prepare applicators and handle sources in the shielded area.

Handle sources only with long forceps. Never touch sources directly with your hands.

Limit working time with sources and remember to use the inverse square law for distances and shielding to good advantage.

11. Monitoring of Personnel Who Handle Sealed Sources

Personnel who are responsible for handling radioactive materials will be issued ring badges for monitoring extremities along with their whole body badge.

All personnel involved in brachytherapy procedures, including nurses caring for these patients, will be issued whole body badges for monitoring whole body dose.

12. Transportation of Sources

An appropriate shielded container will be used for transporting sources between the storage safe and their place of use.

Iridium-192 seeds may be transported in the shielded shipping container supplied by the manufacturer.

13. Inpatient Isolation, Surveys, and Postings

- a. Notify unit of scheduled procedure to ensure that appropriately trained personnel are available.
- b. A radiation survey will be performed in the patient's room at the time of implant. The survey will be noted in radiation survey after implant section of the "*Radioactive implant surveys*" form. Recommended daily exposure time limits for visitors will be recorded on "*Radioactive implant patients nursing instruction*" and posted outside patients' room.
- c. If the implant and/ or removal is done in surgery, the operating room will be surveyed after the patient and remaining sources have left the area to determine that no sources have been left behind. Both surveys will be noted with the "*Eye Plaque Surgical Room Survey and/ or Release Record*" form.
- d. Post Radiation emergency instructions; Instructions for visitors; and appropriate radioactive material sign on patient room door or in holders next to the door at the time of implant. Also corresponding information will be entered in the "*Radioactive Implant Patients Nursing Instruction*" form. At the time of the dismissal survey these signs will be removed.
- e. After the sources have been removed from the patient and all sources have been accounted for, the patient and room will be surveyed to ensure that all temporary implant sources have been removed from the patient and room. This dismissal survey will be recorded on "*Radioactive implant surveys*" form.
- f. Notify unit nursing when patient room is available for general hospital use.

14. Outpatient Surveys and Release (Eye Plaque)

- a. After both implant and removal the operating room will be surveyed after the patient and remaining sources have left the area to determine that no sources have been left behind. Both surveys will be noted with the "*Eye Plaque Surgical Room Survey and/ or Release Record*" form.
- b. Record of release survey on *Eye Plaque Surgical Room Survey and/or Release Record* must be performed and noted before the release of Eye Plaque outpatients.
- c. Patients that are released for outpatient therapies must be provided with and understand the patient instructions "*Radiation Safety Guidelines for Eye Plaque Patients*".

15. Records Retention

All written directives will be retained for a minimum of 3 years after the date of administration according to 10 CFR 35.2040.

**WRITTEN DIRECTIVE
FOR
LOW DOSE RATE BRACHYTHERAPY**

Patient Name: _____

Date of Birth: _____

Scheduled Date: _____

Prior to administration (afterloading):

Procedure: _____

Radionuclide: _____

Treatment Site: _____

Prescribed dose: _____ mg Ra eq-Hr / cGy
(circle one)

Authorized Physician Signature

Date of Written Directive

Applied Distribution:

State Nominal Source Strength

(Fill in "Applied distribution" only when sources are removed from safe.)

After implantation but prior to procedure completion:

Treatment Site: _____ Radionuclide: _____ Number of Sources implanted: _____

Prescribed Dwell Time: _____ hours Total Source Strength: _____ mg Ra eq/ mCi
(circle one)

The "Applied Distribution" was implanted in the patient in the manner and distribution as shown above:

Authorized Physician Signature

Date

Revised Dose Prescription:

Revised Dose Prescription: _____ mg Ra eq-Hr / cGy
(circle one)

Revised dwell time: _____ hours

Authorized Physician Signature

Date

Brachytherapy Treatment Record

Patient Name: _____

Prior to administration (afterloading):

Dose Calculation Check:

Dose calculations and/or computer plan originally done by _____ on Date: _____

Calculations and/or plan checked and reviewed by _____ on Date: _____

Source Position Verification:

The source position is verified by Orthogonal Films _____; CT _____; or Fixed Geometry Applicator (Describe)

Patient Identity Verification: (minimum two methods)

Patient asked to confirm name (yes no) and comparison made with (circle one or more) the following information in the patient's record: birth date, address, SSN, ID bracelet or card, and/ or photograph. By _____ Date: _____

After Removal:

Treatment Summary	
Source In	Date: _____ Time: _____
Source Out	Date: _____ Time: _____
Number of Sources or Number of Ribbons and Seeds: _____	
Total Source Strength:	mg Ra eq or mCi
Total number of hours delivered: _____	
Total Dose Delivered:	mg Ra eq-hr or cGy

SITE	EXTERNAL Date	IMPLANT I Date	IMPLANT II Date	TOTAL
RT A or Other				
LT A or Other				
RT B or Other				
LT B or Other				
BLADDER or Other				
RECTUM or Other				
RT Mid External				
LT Mid External				
RT Ovoid Surface				
LT Ovoid Surface				

CESIUM-137 SOURCE USE LOG

Individuals permitted to handle sources: (Initial by name to use initials below)	_____ Susan M. Smith, M.D. _____ Terry Wall, M.D. _____ Jay Robinow, M.D.	_____ John C. Erb, Ph.D. _____ Pete J. Debus, M.S.	_____ Mollye Hancock, BSRT _____ Nancy Foltz, BSRT _____ Andrew Troncalli
---	---	---	---

Sources Used	Sources Left in Safe	Applicator/Distribution	Patient Information	Removed from Storage	Returned to Storage	Sources Returned	Total Inventory at Return
_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL		Name: _____ Physician: _____ Room#: _____	Date: _____ Time: _____ Name: _____	Date: _____ Time: _____ Name: _____	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq (04) _____ 10 mgRaEq (10) _____ 15 mgRaEq (08) _____ 20 mgRaEq (06) _____ 25 mgRaEq (02) TOTAL (30)
_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL		Name: _____ Physician: _____ Room#: _____	Date: _____ Time: _____ Name: _____	Date: _____ Time: _____ Name: _____	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq (04) _____ 10 mgRaEq (10) _____ 15 mgRaEq (08) _____ 20 mgRaEq (06) _____ 25 mgRaEq (02) TOTAL (30)
_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL		Name: _____ Physician: _____ Room#: _____	Date: _____ Time: _____ Name: _____	Date: _____ Time: _____ Name: _____	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq (04) _____ 10 mgRaEq (10) _____ 15 mgRaEq (08) _____ 20 mgRaEq (06) _____ 25 mgRaEq (02) TOTAL (30)
_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL		Name: _____ Physician: _____ Room#: _____	Date: _____ Time: _____ Name: _____	Date: _____ Time: _____ Name: _____	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq (04) _____ 10 mgRaEq (10) _____ 15 mgRaEq (08) _____ 20 mgRaEq (06) _____ 25 mgRaEq (02) TOTAL (30)
_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL		Name: _____ Physician: _____ Room#: _____	Date: _____ Time: _____ Name: _____	Date: _____ Time: _____ Name: _____	_____ 5 mgRaEq _____ 10 mgRaEq _____ 15 mgRaEq _____ 20 mgRaEq _____ 25 mgRaEq TOTAL	_____ 5 mgRaEq (04) _____ 10 mgRaEq (10) _____ 15 mgRaEq (08) _____ 20 mgRaEq (06) _____ 25 mgRaEq (02) TOTAL (30)

Note: Per 10 CFR 35.2406, this record must be kept for three years from the date of the most recent entry.

Ir-192 SEED SOURCE USE LOG

<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>Returned to Vendor</u> <u>Date Returned</u>
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Seeds Returned</u>
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Name</u>
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Company Name</u>
<u>Total Activity</u>					
<u>Assay Date</u>					
<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>Returned to Vendor</u> <u>Date Returned</u>
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Seeds Returned</u>
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Name</u>
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Company Name</u>
<u>Total Activity</u>					
<u>Assay Date</u>					
<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>Returned to Vendor</u> <u>Date Returned</u>
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Seeds Returned</u>
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Name</u>
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Company Name</u>
<u>Total Activity</u>					
<u>Assay Date</u>					

Note: Per 10 CFR 35.2406, this record must be kept for three years from the date of the most recent entry.

Revision: April 7, 2006

**WRITTEN DIRECTIVE
FOR
EYE PLAQUE**

Patient Name: _____

Date of Birth: _____

Scheduled Date: _____

Prior to administration (afterloading):

COMS Plaque Size: | 10mm | 12mm | 14mm | 16mm | 18mm | 20mm | 22mm

Treatment Site: | Oculus Dexter | Oculus Sinister Radionuclide: | I-125
| Pd-103

Prescribed dose: _____ Gy / cGy ^(circle one) at prescription point _____ mm

Authorized Physician Signature

Date of Written Directive

After implantation but prior to procedure completion:

Treatment Site: | Oculus Dexter | Oculus Sinister Radionuclide: | I-125
| Pd-103

Number of Sources implanted: _____

Total Source Strength: _____ mCi Prescribed Dwell Time: _____ hours

Authorized Physician Signature

Date

Revised Dose Prescription:

Authorized Physician Signature

Date

Eye Plaque Surgical Room Survey and/or Release Record

Patient Name: _____

Dose Calculation Check:

Dose calculations and/or computer plan originally done by _____ on Date: _____

Calculations and/or plan checked and reviewed by _____ on Date: _____

Patient Identity Verification:

Patient asked to confirm name (yes no) and comparison made with (circle one or more) the following information in the patient's record: birth date, address, SSN, ID bracelet or card, and/ or photograph. By _____ Date: _____

Patient Admission / Isolation Orders

- 1) No Admission [I-125: Activity < 9 mCi] [Pd-103: Activity < 40 mCi] *
- 2) No Admission Dose Rate @ [I-125: 1 meter < 1 mrem/hr] [Pd-103: 1 meter < 3 mrem/hr]*
- 3) Admit, Release after Dose Rate @ [I-125: 1 meter < 1 mrem/hr] [Pd-103: 1 meter < 3 mrem/hr]*
- 4) Admit, Release after removal of implant
- 5) Other: _____
- 6) Patient provided Written Instructions prior to Release
 (I-125: Activity > 2 mCi; Dose Rate @ 1 meter > 0.2 mrem/hr)*
 (Pd-103: Activity > 8 mCi; Dose Rate @ 1 meter > 0.7 mrem/hr)*

* In accordance with NUREG 1556, Vol. 9, Table U.1

Record of Release Survey (required for item 2 and 3 above)

Survey Meter: _____ Serial #: _____ Background: _____ (mrem/hr)

Patient Radiation Measurement: _____ mrem/hr at 1-meter

Signature: _____ Date: _____ Time: _____

Surgical Room Survey after Implant

A survey of the surrounding area failed to indicate any remaining sources that were not implanted. All readings were at background.

Survey Meter: _____ Serial #: _____ Background: _____ (mrem/hr)

Signature: _____ Date: _____ Time: _____

Surgical Room Survey after Removal

____ Individual sources were removed from the patient. A survey of the patient and surrounding area failed to indicate any remaining sources in the patient. All readings were at background.

Survey Meter: _____ Serial #: _____ Background: _____ (mrem/hr)

Signature: _____ Date: _____ Time: _____

Treatment Summary	
Source In:	Date: _____ Time: _____
Source Out:	Date: _____ Time: _____
Number of Seeds:	
Apparent Activity per Seed::	mCi
Total Source Strength:	mCi
Total number of hours delivered:	
Dose Rate at Prescription Point:	
Total Dose at Prescription Point Delivered:	

RADIOACTIVE IMPLANT PATIENTS NURSING INSTRUCTIONS

PATIENT NAME: _____	ROOM#: _____
----------------------------	---------------------

RADIONUCLIDE	AMOUNT
<input type="checkbox"/> Cesium-137 <input type="checkbox"/> Iridium-192 <input type="checkbox"/> Iodine-125 <input type="checkbox"/> Pladium-103 <input type="checkbox"/> Other: _____	_____ mCi or _____ mgRaEq Number of Seeds/ Sources: _____

INSERTION	PROJECTED REMOVAL
Date: _____ ; Time _____	Date: _____ ; Time _____

TYPE OF IMPLANT	ANATOMICAL LOCATION
<input type="checkbox"/> Tandem & Ovoids <input type="checkbox"/> Burnett <input type="checkbox"/> Tandem Only <input type="checkbox"/> Eyeplaque <input type="checkbox"/> Ovoids Only <input type="checkbox"/> Interstitial Needles <input type="checkbox"/> Interstitial Ribbons <input type="checkbox"/> Endobronchial <input type="checkbox"/> Other: _____	

INSTRUCTIONS FOR VISITORS
<input type="checkbox"/> No Restrictions <input type="checkbox"/> No pregnant visitors & No visitors under the age of 18 years <input type="checkbox"/> Visitors must remain in "visitor chair"; Visitation time limited to _____ hours per day. <input type="checkbox"/> No visitors allowed <input type="checkbox"/> Other Instructions: _____

NURSING INSTRUCTIONS
<input type="checkbox"/> Patient is restricted to room <input type="checkbox"/> Patient is restricted to bed <input type="checkbox"/> Patient must not move <input type="checkbox"/> No pregnant nurses <input type="checkbox"/> WEAR your radiation badge when rendering care; DO NOT share or use someone else's badge <input type="checkbox"/> If a source appears to be dislodged, follow Radiation Emergency Instructions <input type="checkbox"/> Omit bed bath <input type="checkbox"/> No perineal care. Pad may be changed as necessary <input type="checkbox"/> Other: _____

RADIATION EMERGENCY INSTRUCTIONS
If the applicators, needles, seeds, capsules, containers, or ribbons become displaced, DO NOT try to replace them. If possible, use forceps to pick up the sources and place them in the lead-lined container; DO NOT touch the source with your hands. Immediately call one of the following individuals (as indicated by checked box): <u>Primary:</u> <input type="checkbox"/> Terry Wall, M.D.; Office: (816) 932-2575; Home: (913) 236-8920; Pager: (816) 247-9019 <input type="checkbox"/> Susan Smith, M.D.; Office: (816) 932-2575; Home: (816) 333-9984; Pager/ Cell: (816) 520-7814 <input type="checkbox"/> Name: _____ Phone: _____ <u>Secondary:</u> <input type="checkbox"/> John C. Erb, Ph.D.; Office: (816) 932-2575; Home: (816) 469-6044; Pager: (816) 440-2685 <input type="checkbox"/> Peter J. Debus, M.S.; Office: (816) 932-2575; Home: (913) 663-3598; Pager: (816) 440-0057 <input type="checkbox"/> Ed Cytacki, Ph. D.; Office: (816) 932-2575; Cell (605) 484-7898; Pager (816) 440-2222 <input type="checkbox"/> Mollye Hancock, CMD; Office: (816) 932-2575; Home: (816) 597-9413; Pager: (816) 440-9722 <input type="checkbox"/> Greg Sackett, M.S., CHP; Office (816) 932-6296; Cell (816) 665-9062

RADIOACTIVE IMPLANT SURVEYS

RADIATION SURVEY AFTER IMPLANT	
<ul style="list-style-type: none"> ☐ Radioactive Materials sign posted ☐ Radiation Area sign posted (>5mrem at 30cm). ☐ High Radiation Area sign posted (>100 mrem at 30cm). ☐ Radiation Emergency Instructions posted. ☐ Instructions for Visitors posted. 	Room #: _____ Survey instrument: ☐ 451P (2292) [Ion Chamber] ☐ Ludlum-3 (158536) [GM] Other: _____
<div style="text-align: center;"> </div>	Measured Dose Rates (mrem/hr): [Location D,E, F can not exceed 2 mrem/hr] Background: _____ A. Bedside: _____ (30 cm from patient at location of source) B. Behind Shield: _____ C. Visitor Chair: _____ D. Doorway: _____ E. Next Room (# _____): _____ F. Next Room (# _____): _____
A survey of the surrounding area failed to indicate any remaining sources that were not implanted.	
Surveyed by: _____ Date: _____	

PATIENT RELEASE CERTIFICATION/ SURVEY AFTER REMOVAL	
<p><u>Temporary Implant:</u> _____ individual sources have been removed and counted from this patient. Using a low-range radiation <i>detection</i> instrument, a survey of the patient and surrounding area failed to indicate any remaining sources. All sources have been returned to the brachytherapy hot lab, and inventoried again.</p>	
Radiation measurement: Background: _____ mrem/hr Patient/ Room: _____ mrem/hr	
Survey instrument: ☐ Ludlum-3 (158536) [GM] ☐ 451P (2292) [Ion Chamber] Other: _____	
Surveyed by: _____ Date: _____	

Reference Info	
Maximum visitor stay time : Conservative estimate _____ 12.5mrem = hours per day visitor may stay dose at visitor chair	100 mrem max dose to visitor per year (allowed) 50 mrem max dose used to be conservative 2 days per treatment 2 treatment per year

Pd-103 SEED SOURCE USE LOG

<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>DIS or Returned to Vendor</u>	
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Date (Returned or DIS)</u>	
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Number of Seeds</u>	
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Name</u>	
<u>Total Activity</u>						<u>Company Name (if returned)</u>
<u>Assay Date</u>						
<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>DIS or Returned to Vendor</u>	
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Date (Returned or DIS)</u>	
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Number of Seeds</u>	
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Name</u>	
<u>Total Activity</u>						<u>Company Name (if returned)</u>
<u>Assay Date</u>						
<u>Received from Vendor</u> <u>Receipt Date</u>	<u>Patient Name</u>	<u>Applicator Type</u>	<u>Removed From Storage</u> <u>Date</u>	<u>Returned to Storage</u> <u>Date</u>	<u>DIS or Returned to Vendor</u>	
<u>Supplier</u>	<u>Room Number</u>		<u>Time</u>	<u>Time</u>	<u>Date (Returned or DIS)</u>	
<u>Number of Seeds</u>			<u>Number of Seeds</u>	<u>Number of Seeds</u>	<u>Number of Seeds</u>	
<u>Activity/ Seed</u>			<u>Name</u>	<u>Name</u>	<u>Name</u>	
<u>Total Activity</u>						<u>Company Name (if returned)</u>
<u>Assay Date</u>						

Note: Per 10 CFR 35.2406, this record must be kept for three years from the date of the most recent entry.

Revision: May 1, 2007

I-125 SEED SOURCE USE LOG

<u>Received from Vendor</u> <u>Receipt Date</u> <u>Supplier</u> <u>Number of Seeds</u> <u>Activity/ Seed</u> <u>Total Activity</u> <u>Assay Date</u>	<u>Patient Name</u> <u>Room Number</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>Returned to Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>DIS or Returned to Vendor</u> <u>Date (Returned or DIS)</u> <u>Number of Seeds</u> <u>Name</u> <u>Company Name (if returned)</u>
<u>Received from Vendor</u> <u>Receipt Date</u> <u>Supplier</u> <u>Number of Seeds</u> <u>Activity/ Seed</u> <u>Total Activity</u> <u>Assay Date</u>	<u>Patient Name</u> <u>Room Number</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>Returned to Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>DIS or Returned to Vendor</u> <u>Date (Returned or DIS)</u> <u>Number of Seeds</u> <u>Name</u> <u>Company Name (if returned)</u>
<u>Received from Vendor</u> <u>Receipt Date</u> <u>Supplier</u> <u>Number of Seeds</u> <u>Activity/ Seed</u> <u>Total Activity</u> <u>Assay Date</u>	<u>Patient Name</u> <u>Room Number</u>	<u>Applicator</u> <u>Type</u>	<u>Removed From Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>Returned to Storage</u> <u>Date</u> <u>Time</u> <u>Number of Seeds</u> <u>Name</u>	<u>DIS or Returned to Vendor</u> <u>Date (Returned or DIS)</u> <u>Number of Seeds</u> <u>Name</u> <u>Company Name (if returned)</u>

Note: Per 10 CFR 35.2406, this record must be kept for three years from the date of the most recent entry.

Revision: August 23, 2006

RADIATION SAFETY GUIDELINES

EYE PLAQUE PATIENTS

Use of radioactive material in your treatment is carefully controlled to assure both your safety and that of members of the general public, including your family. Although there is virtually no risk to others from the Iodine-125 or Pladium-103 eye plaque, it is important to take some precautions to ensure a safe and optimum treatment result:

1. You must agree to remain within the Kansas City Metropolitan area for the duration of the implant.
2. You must agree to return to TCI – Wornall Campus (Saint Luke’s Hospital Radiation Therapy Department) at the designated appointment times to have your implant reviewed.
3. You must agree to return to Saint Luke’s Hospital at the required date and time to have your eye plaque removed.
4. In the unlikely event that any part of the eye plaque becomes loose or falls off, please call us immediately.
5. Keep your eye plaque and associated bandages dry at all times.
6. A leaded-eye patch will be placed over your eye to reduce radiation exposure to others. To further reduce exposure, minimize time in close proximity to others (within 1 yard). Closer contact is OK, but try to keep the duration brief (less than 30 seconds at any one time).

Should you have any questions about the above guidelines or experience any difficulty during the treatment, please call:	(816) 932-2575
--	-----------------------

My eye plaque will be removed on: _____

I will meet with the Radiation Oncologist at TCI (Saint Luke’s Radiation Therapy) at the following days/times: _____

<p>The above guidelines have been discussed with me and I will comply with them.</p> <p>Signature _____ Date: _____</p> <p>Print name: _____</p>
--

A copy of this document will be provided to you for your reference