In general, no special precautions are necessary for patients who have received tracer doses of radioactive material for nuclear medicine diagnostic studies. The amount of radioactive material use is small, producing little radiation outside the patient's body. If urine or stool samples are required from these patients, universal body substance precautions will also be effective in controlling radioactive material contamination.

One form of radiation therapy, called radiopharmaceutical therapy, utilizes radioactive materials in unsealed liquid form. The liquid is administered to the patient by injection or ingestion. Since the radioactive material is incorporated in body fluids, universal body substance precautions are necessary to reduce the chance of radioactive material contamination. In addition to the contamination concern, radiopharmaceutical therapy patients can produce a measurable gamma radiation field at some distance from their body. Measures need to be taken to reduce the time spent with these patients and to perform necessary duties at the maximum possible separation.

Some patients also are treated for cancer by implanting small sealed radiation sources in the tumor. The only concern in caring for these patients is protecting oneself from the external radiation field. Nursing personnel are to complete tasks in an orderly, efficient manner, spending only as much time in the room as is necessary for the patient's physical and emotional well-being. The radiation exposure to people entering the patient's room will be small as long as time spent in the room is not excessive.

All patient rooms where significant radiation levels are present will be identified by a sign on the door bearing the words "Radiation" and the three-bladed radiation symbol. Contact the nurse in charge for specific instructions before entering the room. The Hospital Health Physicist is also available if any questions are not answered to your satisfaction.

**Radiation Safety During Nursing Care**

The Radiation Safety Office staff is available to assist the nursing and medical staff in keeping the hazards of exposure to radiation to a minimum, and to assist With any problems. The Hospital Health physicist will normally be aware that a patient is to receive a therapeutic dose of radioactive material. Notifying the Radiation Safety Office at 3-3190 will assure that the proper surveillance is scheduled during the period of treatment. When the patient is discharged, it is important that the room is cleared by Radiation Safety and the Radiation Oncology physician before it is assigned for reoccupancy.

**General Principles**

A. Hazards increase with increased dosage levels of radionuclides.
B. Hazards of radioactive material arise from three sources:
   1. Contamination of the skin
   2. Incorporation in the body through ingestion, inhalation, or injection
   3. External exposure from radioactive material in the patient's body

C. Skin contamination, ingestion, and inhalation are prevented to a large extent by practicing good personal hygiene.

D. External irradiation is reduced by minimizing close contact with patients who have received therapeutic doses of radioactivity. Time and distance determine the exposure. (A dose rate of 100 mR/hr at one foot from the patient will be only 4mR/hr at five feet from the patient.)

E. Equipment, patient's rooms work areas, and personnel should always be monitored with proper radiation instruments anytime contamination is suspected, and after every radioactive material therapy patient. (Call the Hospital Health Physicist, 3.3190.)

F. No special precautions are required for patients who receive small amounts of radioactive material for diagnostic tests, i.e., bone scans, gallium scan.

G. Special precautions described below are necessary when therapeutic doses of unsealed radioactivity are administered to patients.

H. Patients receiving radiation therapy from sealed radioactive sources implanted in their tumors do not pose any contamination hazard. Needed precautions are limited to external exposure reduction techniques.

I. Radiation doses to nursing personnel remain well below the levels allowable to anyone in the general public. However, individuals on nursing units caring for a large number of treated patients will be assigned dosimeters to assure low personnel exposure, and to alert radiation safety staff of potential problems.

J. Washington Administrative Code restricts radiation exposure in areas adjoining a patient treated with radioactive materials to 2 millirem in an hour. Since most treatments last about two days, 2 millirem per hour is the maximum exposure rate allowed in adjoining areas (2 mrem/hr x 48 hrs = 96 mrem). When the treatment time is extended or more than one patient is treated in a given room in less than seven days, the allowable exposure rate in adjoining areas may be less than 2 millirem per hour. In any event, measures must be taken to limit radiation exposure in adjoining areas. This may often necessitate "blocking" an adjacent room, since it would be unacceptable for patient occupancy.

K. Nursing duties should be performed quickly, but with consideration for the patient's needs and concerns.
II. CARE OF PATIENTS RECEIVING IODINE-131 THYROID THERAPY

OVERVIEW:
Patients receiving I-131 isotope (I-131 swallow patients) for treatment of Thyroid cancer need to be admitted to the lead lined rooms on 6NE (6218, 6220) or on 6SE (6318, 6320).

1. Room preparation, prior to the antibody infusion:

   A. Use only masking tape to secure drapes, blue pads or plastic bags to the floor, walls or furniture.

   B. Use blue pads (chux) and/or surgical 3/4 drapes to cover:
      1. Floor around bed. *
      2. Floor in front of sink.
      3. Floor from bed to bathroom and under toilet.
         a. For male patients drape the wall behind the toilet also.
      4. The seat back and arms of blue chair.
      5. Any table surface that may be contaminated with patient's body substances.

   • See diagram, last page

   C. Use plastic bags to cover:
      1. Bathroom door knob.
      2. Hand controls for TV, bed, call button, and telephone.
      4. Other items in the room that the patient touches, such as light switches, faucet handles, toilet seat, etc. also need to be covered.
         a. Use tape to cover soap

   D. Provide the patient with a hospital gown or pajamas and a hospital robe to change into prior to the antibody infusion (see #6 on pg. 3).

   E. During set-up, treat toilet bowl and porcelain rim with Betadine solution. Let it contact porcelain until arrival of patient, then flush.

   F. A portable linen hamper should be placed in the patient's room.
2. Prior to isotope administration obtain patient vital signs; under normal circumstances this will be the last time vital signs will be necessary for the duration of the patient's stay.

3. Precautions after administration of I-131 isotope:

   A. The Hospital Health Physicist will post a radioactive material sign and precaution list at the room entrance. Radiation zones are recorded on a room map posted at the room entrance also. Routine monitoring to determine radiation levels will be performed by radiation safety personnel.

   B. A lead shield should be placed at the doorway. As much care for the patient as possible should be done with the shield between the RN and the patient.

   C. Patients will be confined to their rooms except for special medical, nursing, or research purposes approved by a Nuclear Medicine physician or the Hospital Health Physicist.

   D. Shoe covers are required and should be available outside the door to the patient room.

   E. Wear gloves whenever touching patient or items in the room.

   F. Request disposable eating utensils and tray from Nutrition Services. Nutrition Services may not deliver meals to patient in room and they may be left for unit staff to deliver.

   G. Environmental Services should be notified to suspend cleaning until radiation safety clears the room after the patient is discharged.

   H. No pregnant individuals or persons under 18 are allowed in the room.

   I. No visitors are allowed in the room. Family and friends may visit patient from the hallway.

   J. Anything coming in contact with patient and/or body substances should be checked by the Hospital Health Physicist prior to release of the regular trash. Urine and feces may be disposed of into the sewage system.

   K. Patient should not take a shower for 48 hours after iodine administration, unless authorized by the Hospital Health Physicist.

4. Radiation safety precautions can stop when the Hospital Health Physicist determines patient has less than 30 millicuries of remaining activity. This corresponds to an exposure rate of less than 7 millirem per hour at one meter from the patient.

5. Room must not be cleaned or released for reoccupancy until checked by Radiation Safety Staff.
6. Belongings of the patient (including clothing) that continue to be radioactive at the time of discharge may need to be left behind. They will be returned to the patient when they are no longer radioactive.

7. In case of patient's death, notify the Hospital Health Physicist and notify the Pathology Department that the patient contains radioactive material.

8. Direct any radiation safety questions to the Hospital Health Physicist 206.543.3198.
III. CARE OF PATIENTS RECEIVING INTRAVENOUS INFUSION OF RADIOLABELED MONOCLONAL ANTIBODIES

SUPPLIES:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Pharmacy Betadine solution</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>100737 Drape, Ig, fanfold, 3/4 sheet</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>100270 Plastic backed absorbent pads (chux sm 24x24)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>100415 Bag, plastic clear sm (specimen)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 roll masking tape</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Patients receiving intravenous infusion of Radiolabeled Monoclonal Antibodies need to be admitted to the lead-lined rooms on 6SE (6318, 6320) or on 6NE (6218, 6220).

1. Room preparation, prior to the antibody infusion:

A. Use only masking tape to secure drapes, blue pads or plastic bags to the floor, walls or furniture.

B. Use blue pads (chux) and/or surgical 3/4 drapes to cover:
   1. Floor around bed. *
   2. Floor in front of sink.
   3. Floor under specimen handling area.
   4. Floor from bed to bathroom and under toilet.
      a. For male patients, drape the wall behind the toilet also.
   5. Shelf under TV.
   6. The seat back and arms of chair.
   7. Any table surface that may be contaminated with patient’s body substances.

* See diagram, last page

C. Use plastic bags to cover:
   1. Bathroom door knob
   2. Hand controls, for TV, bed, call button and telephone
   3. Bed control buttons
   4. Other items in the room that the patient touches, such as light switches, faucet handles, toilet seat, etc. also need to be covered.
      a. Use tape to cover soap dispenser handle, closet knobs, blind controls.

D. Provide the patient with a hospital gown or pajamas and a hospital robe to change into prior to the antibody infusion

E. During set-up, treat toilet bowl and porcelain rim with Betadine solution. Let it contact porcelain until arrival of patient, then flush.
F. A portable linen hamper should be placed in the patient's room.

G. A large waste receptacle (supplied by Hospital Health Physicist and stored in supply room on 6SE) to be used by the patient during isolation.

H. Dynamap ordered and covered with bags, so patients can be instructed to take their own BP.

2. After the administration of Radiolabeled Monoclonal Antibodies:

A. The Hospital Health Physicist will post a radioactive material sign and precaution list at the room entrance. Radiation zones are recorded on a room map posted at the room entrance also. Routine monitoring to determine current radiation levels will be performed by radiation safety personnel.

B. A lead shield should be placed at the doorway. As much care for the patient as possible should be done with the shield between the RN and the patient.

C. Patient will be confined to their rooms except for special medical, nursing, or research purposes approved by a Nuclear Medicine physician or the Hospital Health Physicist.

D. Shoe covers are required and should be available outside the door to the patient room.

E. Wear gloves whenever touching patient or items in the room.

F. Request disposable eating utensils and tray from Nutrition Services. Nutrition Services may not deliver meals to patient in room and they may be left for Unit staff to deliver.

G. Environmental Services should be notified to suspend cleaning until radiation safety clears room after patient is discharged.

H. No pregnant individuals or persons under 18 are allowed in the room.

I. No visitors are allowed in the room. Family and friends may visit the patient from the hallway.

J. Anything coming in contact with patient and/or body substances should be checked by the Hospital Health Physicist prior to release of the regular trash. Urine and feces may be disposed of into the sewage system.

K. Patient should not take a shower for 48 hours after iodine administration, unless authorized by the Hospital Health Physicist.

L. The patient should treat the toilet bowl with Betadine solution every time after flushing for the duration of the radiation isolation.

M. All specimens sent to the laboratory will be labeled with a yellow and red radioactive label.
N. Patients take their own vital signs, draw their own labs and flush their central lines.

3. Radiation safety precautions can stop when the Hospital Health Physicist determines patient has less than 30 millicuries of remaining activity. This corresponds to an exposure rate of less than 5 millirem per hour at one meter from patient.

4. Room must not be cleaned or released for reoccupancy until checked by Radiation Safety Staff.

5. Belongings of the patient (including clothing) that continue to be radioactive at the time of discharge may need to be left behind. They will be returned to the patient when they are no longer radioactive.

6. In case of patient's death, notify the Hospital Health Physicist and notify the pathology department that the patient contains radioactive material.

7. Direct any radiation safety questions to the Hospital Health Physicist, 206.543.3190.
ROOM PREPARATION:
A. Prior to administration of the dose, preparation of patient's room:

1. Lead lined rooms on 6NE are necessary for these patients.

2. Use plastic-backed absorbent pads to cover:
   a. Floor at both sides of bed
   b. Around blood draw area (to include shelf and floor under TV)
   c. Trail to bathroom and around toilet

3. Use plastic bags to cover:
   a. Telephone
   b. TV controls
   c. Other items in the room that the patient touches, such as the light switch, faucet handles, toilet seat, etc., also need to be covered.

4. Assure that the patient is wearing a hospital gown and not personal apparel.

5. Pretreat toilet with four to eight ounces of Betadine to water and exposed porcelain surfaces.

6. A large, portable, linen hamper should be assigned for use in the patient's room.

7. Place several plastic-backed absorbent pads under the patient. Also use pads around catheter insertion point.

8. Notify the Hospital Health Physicist to assist in monitoring dose administration.

B. During administration

1. Physician should wear double examination gloves. Outer pair should be changed frequently during procedures, especially whenever any tubing is changed.

2. Several 4x4 cloth pads and a piece of Tegaderm should be available to catch drips and secure dose administration site if catheter is removed.

3. If pressure bag is used for isotope administration, a plastic bag shall be placed in the pocket with a hole in the bottom for access to the tubing connection.

C. After administration

1. Post the radioactive material sign and precaution list at the room entrance.
2. Patient will be monitored by Radiation Safety staff soon after dosage administration. Radiation zones are recorded on a room map that is posted at the room entrance. Routine remonitoring is necessary to determine reduction in radiation rates in anticipation of time of patient release.

3. Patients will be confined to their rooms except for special medical, nursing, or research purposes approved by their Nuclear Medicine physician or the Hospital Health Physicist.

4. Wear gloves whenever touching patient or items in room.

5. Request disposable eating trays and utensils from dietary. Dietary may not deliver patient's meal tray into the room, nursing may need to do this.

6. Send request to Environmental Services to suspend cleaning of the room.

7. No pregnant individuals or persons under 18 are allowed in the room.

8. No visitors allowed in room. Family and friends may visit patient for given amounts of time from the hallways by patient's room.

9. No smoking by anyone.

10. Anything coming in contact with patient's body substances (includes saliva, vomitus, perspiration) should be checked by the Hospital Health Physicist prior to release into regular trash. Urine and feces may be disposed of into the sewage system.

11. Patients should not take a shower or bath for 48 hours after dose administration, unless authorized by Hospital Health Physicist. The patient's surgical incision may preclude any baths or showers.

12. For the first several hours following administration, be alert for possible extracavity leakage.
   a. Inform the physician in charge and Radiation Safety if, at any time, the dressings become damp, stained, or bloody.
   b. Wear two layers of examination gloves.
   c. Wipe up liquid without spreading it.
   d. Store wet bedding, dressings, Linen, clean-up cloths, etc. in a labeled bag or placed in a corner of the room on top of a plastic-backed absorbent pad.
   e. Identify to Radiation Safety personnel what the contaminated liquid came in contact with and who helped clean it up.

13. Surgical dressing and bandages should be changed only as directed by the physician in charge.
D. Patient can be released when the Hospital Health Physicist determines patient has less than 30 millicurie remaining activity. This corresponds to an exposure rate of less than about 7 millirem per hour at one meter from patient.

E. Room must not be cleaned or released for reoccupancy until checked by Radiation Safety staff.

F. Belongings of the patient (including clothing) that continue to be radioactive at the time of patient discharge may need to be left behind. They can be returned to the patient when they are no longer radioactive.

G. In case of patient's death, notify the Pathology Department that this patient contains radioactive material. Also, notify the Hospital Health Physicist.

H. Direct any safety questions to the Hospital Health Physicist, 206.543.3190.
A. Prior to administration of the dose, preparation of patient's room:
   1. Place several plastic-backed absorbent pads (Chux) under the patient.
   2. Assure that the patient is wearing a hospital gown and not personal apparel.
   3. Cover all areas of possible contamination. Use plastic-backed absorbent pads at bedside floor, on work cart, and around catheter insertion point.
   4. Notify the Hospital Health Physicist to assist in monitoring dose administration.

B. During administration
   1. Physician must wear examination gloves. Gloves should be changed frequently during procedures, especially whenever any tubing is changed.
   2. Several 4x4 cloth pads and a piece of Tegaderm should be available to catch drips and secure dose administration site if catheter is removed.
   3. If pressure bag is used for isotope administration, a plastic bag shall be placed in the pocket with a hole in the bottom for access to the tubing connection.

C. After administration
   1. Contaminated materials will be removed from patient's room by Radiation Safety or Nuclear Medicine staff.
   2. Personnel may spend whatever time is necessary in the room. The P-32 beta particles are completely absorbed in the patient's body, and there is no significant external radiation.
   3. The P-32 is a colloid and remains in the body cavity. There are no special precautions for sputum, urine, vomitus, feces, dishes, linen, or instruments.
   4. Radiation safety precautions are concerned only with the control of contamination from the catheter insertion wound.
      a. Patient must remain in the room a minimum of 12 hours post administration (preferable 24 hours) and any time there is leakage from the wound.
b. For the first 24 hours post administration:
   i. Gloves are recommended while handling the patient, particularly around the site of dosage administration.
   ii. Surgical dressings and bandages should be changed only as directed by the physician in charge.

c. Any time extracavitary leakage is detected:
   i. Inform the physician in charge and Radiation Safety, if at any time, the dressings become damp, stained, or bloody.
   ii. Wear examination gloves
   iii. Wipe up liquid without spreading it.
   iv. Store wet bedding, dressings, linen, clean-up cloths, etc. in a labeled bag or place in a corner of the room on top of a plastic-backed absorbent pad.
   v. Identify to Radiation Safety personnel what the contaminated liquid came in contact with, and who helped clean it up.

D. In case of patient's death, notify the Pathology Department that this patient contains radioactive material. Also, notify the Hospital Health Physicist.

E. If surgical dressings are changed prior to patient discharge, they should be monitored by Radiation Safety personnel.
READ BEFORE ENTERING ROOM

RADIATION ROOM SURVEY

This survey form is to remain in the room until removed by Radiation Safety staff. If you have any questions, call the Hospital Health Physicist at 543-3190.

Patient Name _______________________________ Date __________________________

Room No. _______________________________ Loading/Dose __________________________ mCi

Physician(s) _______________________________ mg Ra Eq

Radionuclide _______________________________ Admin/Implant Date __________________________

Chemical/Physical Form _______________________________ Discharge/Removal Date __________________________

VISITOR

The following zones will tell you where to be in the room and how long to stay.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Maximum Time</th>
<th>Radiation Exposure Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td></td>
<td>&gt; 100 mR/hr</td>
</tr>
<tr>
<td>II</td>
<td>1 hour/week</td>
<td>10 mR/hr to 100 mR/hr</td>
</tr>
<tr>
<td>III</td>
<td>10 hours/week</td>
<td>2.5 mR/hr to 10 mR/hr</td>
</tr>
<tr>
<td>IV</td>
<td>No Time Limit</td>
<td>1 mR/hr to 2.5 mR/hr</td>
</tr>
<tr>
<td>V</td>
<td>No Time Limit</td>
<td>&lt; 1 mR/hr</td>
</tr>
</tbody>
</table>

HOSPITAL STAFF

Classifications of radiation exposure to hospital staff, read at 1 meter from patient.

- Low Less than 5 mR/hr
- Medium 5 to 20 mR/hr
- High > 20 mR/hr

RADIATION SAFETY STAFF

Comments:

- Yes ☐ No ☐ Patient surveyed and sources removed. _________ Initials

OR

- Yes ☐ No ☐ Room is free of radioactive contamination. _________ Initials

Surveyed By: ___________________________ Title: ___________________________ Date: ___________________________