PROCEDURE FOR THE USE OF PROTECTIVE CLOTHING AND DOSIMETER

To prevent personnel from becoming contaminated with radioactive material, protective clothing essentially consisting of the same items normally used by surgeons in the operating room i.e., a scrub suit or surgical suit, surgical gown, latex gloves, and a surgical mask and cap, augmented by shoe covers and vinyl aprons will be issued at the Control Point. All work past the Control Point requires protective clothing, independent of the degree of contamination present on the patient or his clothing.

Each person entering REA should don one (1) scrub suit and one (1) surgical gown (if disposable decontamination outfit is not available), two (2) sets of surgical gloves and two (2) vinyl aprons and masks. After gross decontamination is completed, the outer gloves and apron are removed. Wound care and decontamination will then be attended to.

I. Removal of Contaminated Protective Clothing

Upon completion of their activities in the Radiation Emergency Treatment Room, personnel will remove their protective clothing and personal dosimeter in the following order:

1. dosimeters
2. tape (if any)
3. surgical gowns (turning them inside-out)
4. headwear
5. mask
6. footwear
7. gloves

II. Clearance Procedures

After having removed protective apparel, each person who occupied the Treatment Area will be monitored by a qualified monitoring technician or by the Control Point nurse.

If no contamination is found, personnel may proceed to the change area and put on their normal clothing. After a final check at the Control Point, they will be cleared to enter the uncontrolled area.

III. Use of Dosimeters

A. Dosimeters will be supplied at the Control Point to all personnel entering the Radiation Emergency Area. A Dosimetry Log shall be maintained on all personnel in the REA. See sample on page 47. Dosimeters are of three types:

1. Direct reading dosimeters ("pen-dosimeters") to monitor exposed dose on a continuing basis. These must be recharged to read "zero" before distribution to each attendee.

2) Badge Dosimeters - to form a permanent record of exposure

3) Ring Dosimeters - to form a permanent record of finger exposure

B. Dosimeters are to be worn in the following manner:

1) At the neck line, clipped under the protective clothing.

2) On the ring fingers of hands, under the gloves, with detecting element at palm surface.

C. Upon leaving the Radiation Emergency Area the wearer shall surrender his dosimeter to the Control Point attendant, who will record the reading and number of the pen dosimeter and retain the badge and ring dosimeters for later processing.

D. The Control Point attendant must assure that the records clearly show the serial number of each dosimeter and period of time worn by each individual who occupied the Radiation Emergency Area. Record must also show Social Security Number and date of birth of the individuals wearing the dosimeters.

PROCEDURE FOR PATIENT DECONTAMINATION AND SAMPLE TAKING

I. General

These procedures cover the use of the Decontamination and Sample Taking Kits. The kits provide all the necessary items for the decontamination of a radioactively contaminated patient and the collection of specimens of this contamination.

The collection of specimens is a prerequisite for a thorough evaluation of the medical and radiation status of the patient. It should be performed in conjunction with patient decontamination.

A list for each of the two kits is provided on pages 40, 41, and 42. There is also a parts list in each kit. Following use, the lists should be consulted for replenishment. The intended use of several of the items is indicated on the parts list.

II. Patient Decontamination Procedures

A. Principles

The objectives of decontamination are:

1. to prevent the spread of contamination over and into the patient;

2. to prevent injury caused by the presence of radioactive substances on the body;

3. to protect attending personnel from becoming contaminated themselves or (in extreme cases) from being exposed to a source of radiation.

Although decontamination should be started as soon as possible, primary attention should be given to the alleviation of life-threatening conditions created by traumatic injury.

Decontamination is essentially the physical removal of radioactive dirt from the skin, wounds, or body orifices. Most decontaminants contain detergents or other chemical agents to facilitate this removal. Therefore most decontaminants are suitable for decontamination of the intact only, i.e., are not appropriate for wound cleansing or irrigation of body orifices.

Decontamination is performed in the following manner:

1. from the highest level of contamination to the lowest;

2. starting with the simplest procedure (e.g., soap and water) to more complicated procedures;

3. with due regard to contamination of wounds, body orifices, etc. (see below for specific guidelines).

Usually, the effect of decontamination is greatest in the earliest stages, i.e., most of the radioactive material is removed during the first decontamination effort. Continued decontamination may show diminishing effectiveness. At some point a decision has to be made to either accept some residual contamination, or proceed with the use of more potent decontaminants (more specific guidelines are seen below).

B. Steps to be Taken for Decontamination

In some cases decontamination may have been started before the patient arrives at New Hanover Memorial Hospital. It can be expected that the residual contamination is minor and or that serious contamination is localized, e.g., around and in a wound. Before decontamination, the following steps should be taken:

1. judge whether the patient's medical condition requires immediate intervention; stabilize wound, if necessary, and redress for later decontamination;

2. obtain a briefing from the radiation physicists as to the contamination status of the patient, the exposure of the patient, and as to the specific measures to be taken by attending personnel with regard to their protection;

3. remove all clothing and monitor the patient with the radiation survey instrument by scanning the entire body (holding the probe about two inches from the skin), and record the findings on the Patient Data Sheets. Patient sampling should be done at this point -- nasal swabs, skin swipes, hair, nails, blood samples, etc.;

4. perform a gross decontamination (see Decontamination Procedures which follow);

5. clean up room and remove outer garments from attendants;

6. proceed with wound survey and decontamination;

7. complete detailed decontamination of patient;

8. transfer patient to "clean" area of hospital.

C. General Decontamination Procedures

Three general rules apply to the performance of decontamination:

1. check the effectiveness of the technique applied by monitoring periodically;

2. avoid the spread of radioactive materials from the area being decontaminated to areas of lesser contamination by covering the adjacent area;

3. collect all debris and trash in a container (bag) for later disposal.

Except when prohibitive degrees of contamination are present on/in any of the locations listed below, decontamination is performed in the following order:

1. high-level intact skin;

2. body orifices and adjacent skin;

3. wounds and adjacent skin;

4. low-level skin areas.

D. Decontamination of Skin

1. take smear sample of area (see "Sample Taking Techniques and Indication" on page 39 under paragraph IV)

2. protect adjacent area if indicated by covering with towels.

3. cleanse skin area; wash thoroughly with Turco soap and tepid water, using either cotton balls, preop sponges or surgical brushes; cover area with a good lather; rinse off after two to three minutes with copious amounts of water; monitor; record results. Collect all water and wastes in appropriate containers.

4. if contamination persists, repeat step (3) once.

5. if contamination still persists, try gentle application of clorox or hydrogen peroxide. NOTE: Avoid any of these entering wound or body openings. Repeat a few times using new cotton balls; remove decontaminants with water; monitor; record results.

6. after complete decontamination dry skin and apply Nivea cream to abrased or injured areas.

7. if residual contamination is present, consult with radiation specialists to decide whether further efforts are indicated; if it is decided to accept residual contamination, dry the skin and apply colloidon or Dermaplast, mark the area involved and record.

8. collect all materials used, such as trash, instruments, solutions, bottles, etc., and place in separate labeled containers.

NOTES: In case of serious contamination around a wound, rapid removal of the bulk of radioactivity can be obtained by shaving. In case of serious contamination of hair or under nails, clip nails, remove hair and scrub thoroughly and repeatedly with intermittent surveying.

E. Decontamination of Body Orifices

1. take samples of activity in nostrils, ear canals, and other orifices as indicated (see "Sample Taking Techniques and Indication").

2. decontaminate area surrounding orifices.

3. gently clean orifices using wetted swabs.

4. if nose swab indicated significant radioactivity in nasal cavity, use nasal blows and nasal irrigation. (Check with Health Physicists regarding contaminated fluid going down patient's throat).

5. collect all materials used and label containers.

F. Decontamination of Wounds

1. use aperture drape to isolate the contaminated wound.

2. survey and take samples of wound (see "Procedures for Sample Taking").

3. decontaminate skin adjacent to wound.

4. depending on surface and depth of wound, irrigate wound with sterile saline, dab with gauze pads soaked in sterile saline to cleanse wound; collect all materials used and place in separate labeled containers.

5. remove obviously necrotic and devitalized tissue surgically; keep all tissue specimens removed.

6. repeatedly monitor wound; record result on patient record sheet

7. if contamination persists, contact appropriate consultants as required to determine further course of action.

8. if wound is clean, treat wound as necessary.

III. Procedures for Sample Taking

A. Principles

The objectives of collecting specimens from a radioactively contaminated patient are as follows:

1. to evaluate the amount and composition of the radioactive contaminants on and in the body;

2. to obtain data with regard to the patient's exposure to external radiation;

3. to supply information on the biological injury inflicted by the irradiation.

B. To meet these objectives, the following types of specimens are collected routinely:

1. materials containing the external contaminant (swabs, smears, tissue samples, contaminated cleansing fluids, etc.);

2. specimens containing internal contaminant (feces, urine, sputum, etc.);

3. in case of neutron irradiation....materials in which neutron induced radioactivity may be present (gold rings, buttons, hair, nail clippings);

4. hematological specimens (whole blood in heparinized, oxalated, and uncoated tubes; blood smears).

C. As the analysis of radioactive samples with regard to their composition is only possible in samples with a relatively high radioactivity, care should be taken to collect and store these samples separately from the usually bulky samples with rather low radioactivity (such as cleansing fluids, drapes, towels, etc.).

D. A sample which is not identifiable as to its source (location, time taken) may be practically worthless; therefore, take care to properly collect, store, and mark all samples.

IV. Sample Taking Techniques & Indications

A. External Contamination:

Before decontamination, the following samples shall be obtained:

1. Skin Smears: Use Nucon smear pads, moisten with a few drops of water, and smear a skin area of about 100 cm^2 (4" x 4"), if possible, by allowing sticky side of the smear to adhere to gloves and rubbing the smear pad over the surface to be sampled; place smear on record paper, record location and time and area smeared, if other than 100 cm^2 and place in envelope.

2. Take samples of nails, hair and collect metallic objects (rings, watches, glasses, belt buckles, etc.).

3. Wound Samples: use either one of the following methods:

   a. for large wounds with visible blood or wound fluid -- obtain a few cc using an eye dropper or syringe; transfer to bottle and label;

   b. for superficial wounds - rub gently with cotton swab; return to tube and label;

   c. for wounds with visible dirt or debris -- remove with cotton tip or use tweezers; transfer sample to small glass vial and label.

B. Internal Contamination:

1. Body Orifices: wet Q-tip with few drops of water; swab, and store in waterproof envelope and label.

2. In all cases where internal contamination is expected: collect urine and feces in containers supplied, and record time of voiding.

C. External Exposure:

In all cases where a total body exposure is suspected:

1. Obtain 10 cc of oxalated blood for complete blood count and differential.

2. Obtain 10 cc of sterile heparinized blood for chromosome analysis.

3. Obtain 10 cc blood for electrolytes and chemistries.

Record time these samples were taken.

PARTS LIST FOR DECONTAMINATION AND SAMPLE TAKING KITS

Skin Decontamination	QUANTITY
Absorbent balls, extra-large	260
Sponge-holding forceps	1
Plastic beaker, large	2
Preop Sponges	6
Surgical Scrub brushes	10
Wash bottle (for localized contamination)	1

Decontaminants (Skin Only)	
Turco decon soap, bottle (for first decon effor, general)	1
Clorox, bottle (for second decon effort	1
Hydrogen peroxide (H_2O_2), bottle (for third decon effort)	

Wound Cleansing	
Gauze pads, sterile	50
Sterile Surgical Gloves, assorted sized	8 pair
Solution bowl, plastic	1
Syringe, 50 cc	1
Cotton-tipped applicators	100
Aperture Drape	1

Note: Shelf life - 3 years.
These kits are located in the Outpatient Medical Clinic.

DECONTAMINATION KIT (Continued)

Decontaminants (Wounds)	QUANTITY
Saline solution, normal*, sterile bottle	1
Betadine Solution, Providone-Iodine, bottle	1
Treatment Agents	
Nivea Cream, jar	1
Colloidin, bottle	1
Potassium Iodide*, bottle	1
Miscellaneous Materials	
Prep Kit	1
Scissors, heavy duty	1
Patient Radiation & Medical Status Anatomical Diagrams	12
Plastic bags, assorted sizes (to hold decon materials after use)	8
Tissue paper, box	1
Notebook	1
Pencils	2
Finger-Nail Clippers	1

*Shelf Life --- 2-3 years

SAMPLE TAKING KIT

Sample Type	Sampling Instrument	Quantity
Nasal	Swabs	4
Aural	Swabs	4
Oral	Swabs	4
Skin Folds	Swabs	4
Swipes	Nucon Smear	25 slots
Hair	Small container	4
Nails	Small container	4
Metallic Objects	Medium Container/ Plastic Bags	2 small 2 large
Blood	10 cc vacutainers	2 heparinized (green) 1 oxalated (gray) 1 sterile (red)
Urine	2000 cc plastic container	1
Feces	Fecal container	1
Wound Exudate	Swabs Eyedropper & Bottle	4 2
Tissue	Containers	2 small 2 medium
Vomitous	Fecal container	2
Irrigation fluids	100 cc plastic bottle	2

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(10) Envelopes

(50) Labels

(2) Pens.....(1) green; (1) writing

(1) Scissors

(1) Tweezers

(1) Clippers

NOTE: One Kit per Patient

AGREEMENT OF NEW HANOVER MEMORIAL HOSPITAL
AND
GENERAL ELECTRIC'S WILMINGTON MANUFACTURING DEPARTMENT

General Electric's Wilmington Manufacturing Department and the New Hanover Memorial Hospital have agreed to provide the following services:

1. Personnel at the Wilmington Manufacturing Department sustaining injuries from ionizing radiation or injuries complicated by radiation exposure or radioactive contamination will be provided care and treatment at New Hanover Memorial Hospital.

2. Consultation services regarding accidents involving radioactive materials will be made available to New Hanover Memorial Hospital, whether originating at Wilmington Manufacturing Department or other locations.

3. Wilmington Manufacturing Department will provide and maintain operation and calibration checks of instruments provided New Hanover Memorial Hospital.

4. Wilmington Manufacturing Department will provide monitoring and decontamination services during or after a radiation/radioactive contamination accident.

5. Wilmington Manufacturing Department will provide decontamination and sample taking kits to be used during radiation/radioactive contamination accidents at Wilmington Manufacturing Department.

6. Wilmington Manufacturing Department will provide equipment for the Radiation Emergency Room

CHECK LIST FOR NOTIFICATION PROCEDURE

Assistant Emergency Department Manager Notifies:

		Contacted	Initial	Time Notified	Time Arrived
1)	Emergency Department Manager				
2)	Director of Ambulatory Serv.				
3)	Director of Ambulatory Care or Administrator on Call				
4)	Radiation Safety Officer				
5)	O. P. D. Manager				
6)	Switchboard				
7)	Nursing Supervisor				
8)	Security				
9)	Engineering Department				
10)	Housekeeping				
11)	Lab (If Needed)				
12)	X-Ray (If Needed)				
13)	O. R. (If Needed)				
14)	Admitting Office (If Needed)				
*15)	N.C. Dept of Human Resources Radiation Team Raleigh, N.C N.C. Highway Patrol				

*If accident was one other than an on site G E. accident or C.P & L.

DATA INFORMATION SHEET

From Caller

Date and Time of Call: _____

Person Calling:

Name: _____

Accident:

Location: _____

Date and Time: _____

Type: _____

No. of Patients: _____

Contamination Present: _____

Injuries: _____

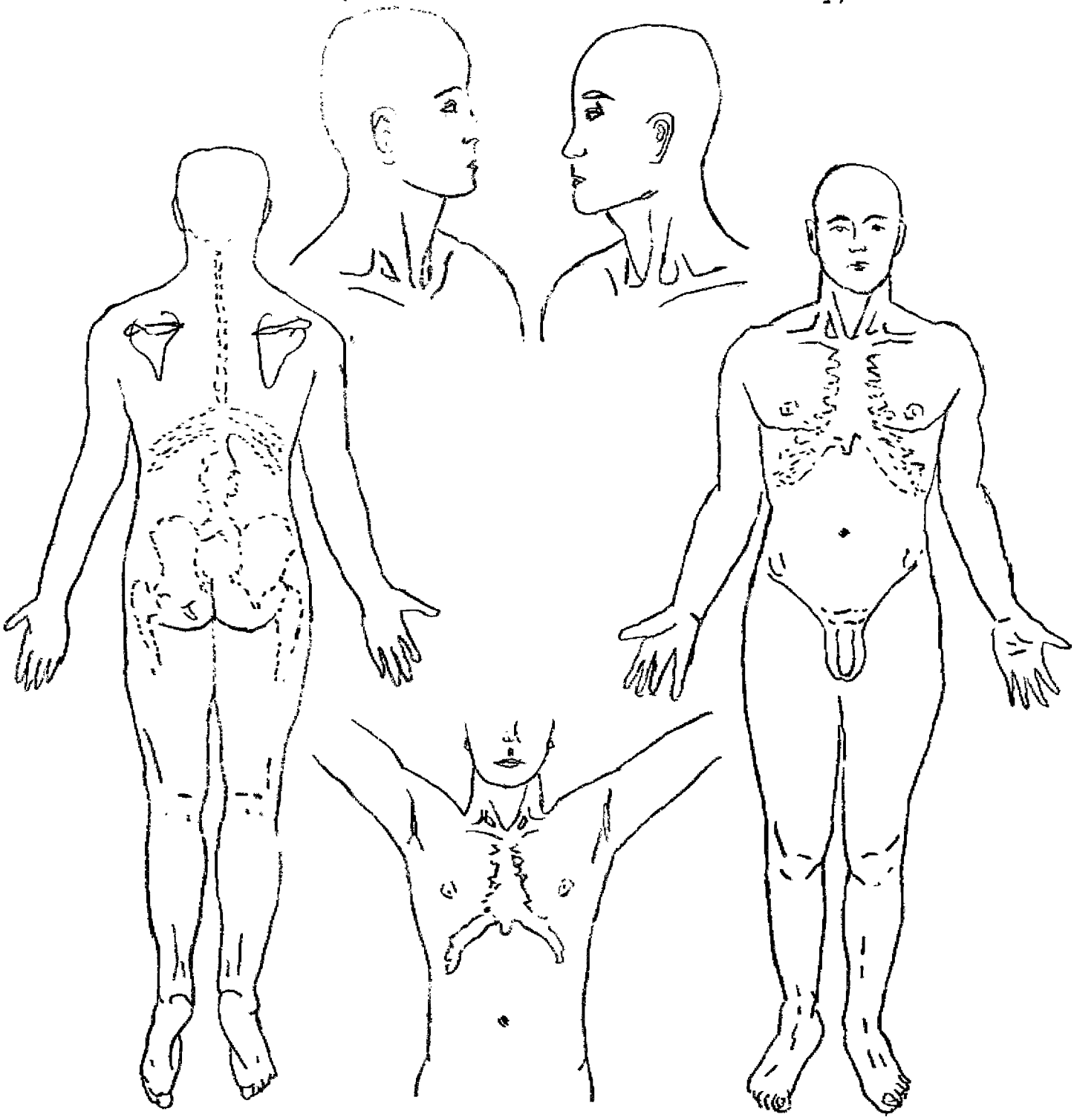
ETA Hospital: _____

PERSONNEL DOSIMETRY LOB

NAME	DATE ISSUED	RING TLD#	POCKET TLD#	PEN DOSIMETER #	INITIAL OF PERSON READING PEN DOSIMETER	SOCIAL SECURITY NUMBER	DATE OF BIRTH

INDICATE CONTAMINATED AREAS AS TO LOCATION,
DEGREE OF CONTAMINATION, DECON EFFORT

INDICATE LOCATIONS OF WOUNDS
PATIENT DATA SHEET
(use additional sheets if necessary)



TYPE OF METER USED: _____
(Indicate model and number)
K-2
DISTANCE SHIN-TO-PROBE: