

Revision: 4
October, 1984

DECONTAMINATION AND TREATMENT
OF
THE RADIOACTIVELY CONTAMINATED PATIENT
AT
SALEM COUNTY MEMORIAL HOSPITAL

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DECONTAMINATION & TREATMENT OF THE
RADIOACTIVELY CONTAMINATED PATIENT AT
SALEM COUNTY MEMORIAL HOSPITAL

A. PURPOSE AND SUMMARY

1. By agreement between Public Service Electric & Gas Company and Salem County Memorial Hospital, personnel at Salem Nuclear Generating Station sustaining injuries from ionizing radiation or injuries complicated by radiation exposure or radioactive contamination will be provided care and treatment at Salem County Memorial Hospital.
2. Most of these injury cases will present no hazard to hospital personnel and will be admitted and provided care and treatment in accordance with the hospital's operating procedures. However, in the event that an accident victim is radioactively contaminated, he will be admitted, decontaminated and treated in accordance with these procedures.
3. The purpose of these procedures is to assure the radiation protection of the hospital staff, other patients and visitors during admission and treatment of the radioactively contaminated patient. The hospital's protection program starts at the Salem Nuclear Generating Station with an alert or warning telephone call to the hospital with information that there has been a radiation accident, and one or more injured and contaminated persons may require treatment. On receipt of such a call, the staff will prepare to admit the patient(s) through the Radiation Emergency Area (REA). The REA will be set up in accordance with the directions given in Section E, "Procedure".
4. Hospital personnel will utilize protective clothing and personnel radiation dosimeters in accordance with directions contained in Attachment D, "Procedure for the Use of Protective Clothing and Dosimeters". Decontamination of the patient(s) as may be required, and the collection of contamination samples will follow the directions given in Attachment E.

B. PRECAUTIONS

There are three major types of radiation exposure which may cause injury:

- 1) penetrating radiation exposure from a source external to the body (gamma rays, neutrons):

B. PRECAUTIONS (Continued)

- 2) internal exposure to radionuclides by ingestion, inhalation, absorption, or through a skin break;
- 3) skin and superficial tissue exposure by contamination of the surface of the body with radioactive materials, including subcutaneous radioactive foreign objects.

A patient who has been excessively exposed to external radiation will not present a hazard to attending personnel. Radiation that has injured a patient will no more harm the attendant than heat that has injured a burn patient will harm the attendant.

A patient who has received an overdose of radionuclides by ingestion or inhalation is no more of a hazard than the patient who has been given diagnostic radioisotopes in a hospital nuclear medicine department.

An individual whose clothing, skin and/or wounds are contaminated with radioactive material may present a radiation hazard to attending personnel in the absence of adequate procedures to prevent the spread of the contaminant or control of the radiation exposure from the contamination.

Since radiation injuries are not immediately life-threatening, primary attention should always be directed to traumatic life-threatening injuries, e.g., severe bleeding, airway obstruction, shock. Concomitantly, or as soon as possible, the patient should be decontaminated.

C. PREREQUISITES

1. Alert/Notification

As soon as it has been established by the Salem Nuclear Generating Station personnel that a patient will be transported to the hospital for treatment, an alert call to this effect will be given. As soon as this has been established, Salem Station personnel will notify the hospital. The alert and notification calls will be directed to the Hospital Switchboard Operator, (609) 935-1000, who, in turn, will notify the Nursing Supervisor.

C. PREREQUISITES (Continued)

2. Prior Action at the Salem Nuclear Generating Station

Before sending the patient(s) to the hospital, the Salem Station personnel will accomplish the following procedures:

- a. Administer first aid.
- b. Notify ambulance.
- c. Call the hospital and inform them of expected arrival time, description of apparent injuries and number of patients.
- d. Decontaminate the patient(s) to an extent compatible with injuries.
- e. Assign station personnel qualified in radiation protection procedures to accompany the patient(s).

D. LIMITATIONS AND ACTIONS

1. Salem County Memorial Hospital is the only treatment facility where radioactively contaminated accident casualties from the Salem Nuclear Generating Station may be treated without explicit approval of the Medical Director of Public Service Electric & Gas Company.
2. All decontamination of hospital personnel, equipment, and facilities shall be supervised by Salem Nuclear Generating Station personnel.

E. PROCEDURE

1. Notification

In accordance with C.1, Salem Nuclear Generating Station personnel will alert the hospital by calling the switchboard operator, who in turn calls one of the following persons in the order listed, during normal hospital hours.

- a. Nursing Supervisor.
- b. President.
- c. Senior Vice President.
- d. Vice President - Nursing.

The initial notification call will be directed to the Nursing Supervisor on duty who will obtain the following information:

- a. Date and time of call.
- b. Person calling:
 - (1) Name
 - (2) Address
 - (3) Telephone Number

E. PROCEDURE (Continued)

The call will then be transferred to E.R. personnel for the following information:

- (1) Location.
- (2) Date and time.
- (3) Number of patients.
- (4) Extent of injuries.
- (5) Contamination status.
- (6) Expected time of arrival.

*After recording this information both parties should hang up and the Nursing Supervisor should redial the Senior Shift Supervisor at 339-3027 or 339-4343, the Shift Supervisor of Salem Unit I at 339-3016 or the Shift Supervisor of Salem Unit II at 339-3026. Verify the authenticity of the call with one of these people. If the call cannot be verified, no further action is required. If the call is verified, proceed with the Code Magenta Plan.

The hospital President will contact and instruct:

- a. Switchboard Operator to declare Code Magenta* (during normal hours).
- b. Nursing Supervisor (during off hours).
- c. Radiation Management Corporation, (215) 243-2990 - 24 hour emergency phone number

2. Nursing Supervisor's Duties+

Prior to Patient Arrival

- A. Complete the top of the form seen under Attachment B (page B-1) of this manual.
- B. Notify Emergency Room physician and nurses.
- C. Report to Radiation Emergency Area and supervise preparation.
- D. Assign nursing personnel to assist physician in treatment room.
- E. Assign Control Point Attendant.
- F. Assign Buffer Zone nurse.

Patient Arrival

Supervise all activities in treatment room and buffer zone.

* Upon declaration of Code Magenta, personnel associated with radiation medical emergencies will report to the REA and perform their respective duties accordingly.

+ NOTE: Should Nursing Supervisor be involved in a code, Emergency Room personnel will perform these duties.

E. PROCEDURE (Continued)

3. Maintenance/Housekeeping Personnel's Duties

Upon notification of Code Magenta, open and prepare Radiation Emergency Area as follows:

Prior to Patient Arrival

Step 1

Clear treatment room of non-stationary supplies and equipment.

Step 2

Obtain radiation emergency supplies from storage closet.

Step 3

Lay floor covering (Herculite) throughout the REA. The pre-cut colored pieces are marked as to proper location.

a. Yellow Herculite, to be placed as follows:

- (1) Ambulance Entrance (outside door and anteroom -- weight this section).
- (2) Treatment Room.
- (3) Anteroom.

b. Green Herculite -- Buffer Zone.

c. White Herculite -- use for patient exit only.

Step 4

Attach decontamination table top to gurney and place 15-gallon water receptacle under drain.

Place 32-gallon lined waste receptacles in treatment room and buffer zone.

Step 5

Erect warning rope and signs across hallway and buffer zone.

Step 6

Attach hose with showerhead to faucet and adjust water temperature to luke warm.

Step 7

Open Decontamination and Sample Taking Kits on table in treatment room.

Step 8

If the possibility of two patients exists, move a second gurney to the area outside the REA until needed.

E. PROCEDURE (Continued)

4. Emergency Room Nursing Personnel's Duties*

*In absence of Nursing Supervisor, perform duties listed under E.2.

Prior to Patient Arrival

- A. Don protective clothing and dosimeters in accordance with directions contained in Attachment D of this manual.
- B. Complete bottom section of form seen under Attachment B (page B-1) of this manual.

Patient Arrival

- A. Assist attending physician in patient stabilization.
- B. Collect bioassay samples in accordance with directions contained in Attachment E of this manual.
- C. Assist in patient decontamination in accordance with directions contained in Attachment E of this manual.
- D. Assist in patient transfer and exit procedures.
- E. Remove protective clothing and dosimeters in accordance with directions contained in Attachment D of this manual.
- F. Insure the ambulance remains in immediate area until released by Salem Station radiation protection personnel.

E. PROCEDURE (Continued)

5. Attending Physician's Duties

Prior to Patient Arrival

- A. Assure that the Radiation Emergency Area is set up for admission of a radioactively contaminated patient.
- B. Assure that necessary medical supplies and equipment are brought to the REA.
- C. Don protective clothing and dosimeters in accordance with directions contained in Attachment D and Diagram III of this manual.

Patient Arrival

- A. In the event of multiple patients, assure that appropriate treatment priority is assigned. If the patient is not critically injured, he should remain in the ambulance and be admitted according to triage method.
- B. Question the accompanying Salem Nuclear Generating Station personnel concerning the patient's contamination status and precautions that should be taken by the hospital staff.
- C. Administer emergency treatment.
- D. Insure that requested medical supplies are passed into decontamination/treatment room.
- E. Decontaminate the patient and collect samples of the contaminant in accordance with Attachment E of this procedure.
- F. Following decontamination and emergency treatment, direct the transfer of the patient from the REA to the appropriate section of the hospital for care or further treatment.
- G. Remove protective clothing and dosimeters in accordance with directions contained in Attachment D of this manual.

E. PROCEDURE (Continued)

6. Control Point Attendant's Duties

Prior to Patient Arrival

- A. Assure that the personnel entering the REA are wearing protective clothing, self-reading pocket dosimeters, film badges and ring TLDs.
- B. Don protective clothing and dosimeters in accordance with directions contained in Attachment D and Diagram III of this manual..
- C. Restrict access to only those personnel authorized entry by the attending physician or Nursing Supervisor.
- D. Maintain a record showing name, time and initial dosimeter reading of each person entering or exiting REA. (Refer to Attachment J).
- E. Record serial numbers of dosimeters, film badges and TLDs, as well as person's name (see Attachment J, Personnel Dosimetry Log).

Patient Arrival

- A. Assure that no person or article is allowed to leave the REA (after the radioactively contaminated patient is admitted) until it has been monitored by Salem Nuclear Generating Station personnel and found to be "clean", i.e., free of detectable radioactive contamination.
- B. Record results of radiation surveys performed by plant radiation protection personnel on anatomical diagrams provided in the decontamination kits and Section J of this manual using a separate diagram for each survey for each patient.
- C. Record dosimeter readings and collect dosimetry from all individuals exiting the REA.

E. PROCEDURE (Continued)

7. Buffer Zone Attendant's Duties

Prior to Patient Arrival

- A. Obtain medical supplies as requested by attending physician.
- B. Don protective clothing and dosimeters in accordance with directions contained in Attachment D and Diagram III of this manual.

Patient Arrival

- A. Pass medical supplies into treatment room as requested by attending physician. DO NOT ENTER TREATMENT ROOM UNLESS SPECIFICALLY REQUESTED TO DO SO BY ATTENDING PHYSICIAN.
- B. Following emergency treatment and decontamination, prepare for removal of the patient from the REA.

- (1) Roll white Herculite from hallway (Clean Area, Diagram II) into Treatment Room.
- (2) Wheel in a "clean" stretcher across the white pathway to the location immediately adjacent to the patient.

NOTE: It is important to remain on white Herculite while in REA to prevent cross-contamination.

- (3) Assist in the transfer of the patient from the decontamination table top to the clean stretcher.

E. PROCEDURE (Continued)

8. President's Duties

- A. Upon notification from switchboard operator of impending patient arrival from Salem Nuclear Generating Station, request that Code Magenta be declared.
- B. Assure that a responsible hospital representative is available to address any media concerns.
- C. Assure that a representative from Public Service Electric & Gas Company is available to address any media concerns.
- D. Provide additional support as required.

E. PROCEDURE (Continued)

9. Plant Radiation Protection Technician's (RPT) Duties

Prior to Patient Arrival

A radiation protection technician (RPT #1) from the Salem Nuclear Generating Station will accompany the patient(s) in the ambulance and bring appropriate instrumentation. If staffing permits, a second radiation protection technician (RPT #2) will arrive at the hospital in a separate vehicle and assist in the duties outlined below.

Patient Arrival

RPT #1

- A. Provide advice and guidance to attending staff regarding radiation exposure and protective actions.
- B. Don protective clothing and dosimeters as provided by hospital staff.
- C. Perform frequent radiation surveys of patient and attendants.
- D. Maintain contamination control to treatment area.
- E. Provide advice and guidance to hospital staff regarding collection of samples and decontamination procedures in accordance with directions contained in Attachment E of this manual.
- F. Decontaminate REA and equipment following patient and attendant exit.

RPT #2

- A. Survey ambulance and attendants prior to departure. If contamination is found, ambulance should be returned to Salem Nuclear Generating Station for decontamination.
- B. Control patient and attendant exit procedures.
- C. Perform radiation surveys of patient and attendants upon exit from the REA.
- D. Collect dosimetry from personnel exiting the REA at termination of emergency and return to Salem Nuclear Generating Station for processing.
- E. Decontaminate REA and equipment following patient and attendant exit.
- F. Maintain contamination control outside of treatment area.

F. RETURN OF REA TO NORMAL USE

Once the patient has been decontaminated, the REA and all equipment will be surveyed, decontaminated as required and released as soon as possible by Salem Nuclear Generating Station radiation protection personnel.

G. PATIENT TRANSFER TO DEFINITIVE CARE CENTER

1. If it is determined by the attending physician, the Medical Director, Public Service Electric & Gas Company and Radiation Management Corporation that the patient should be transferred to a definitive care center for the evaluation, diagnosis and long-term care of the radiation injury, this patient can be transferred to RMC's definitive care center located at the Hospital of the University of Pennsylvania in Philadelphia.
2. Arrangements for transportation of the patient will be coordinated through Radiation Management Corporation (215) 243-2990 -- 24-hour emergency phone number.

H. PROCEDURE FOR HANDLING MULTIPLE VICTIMS

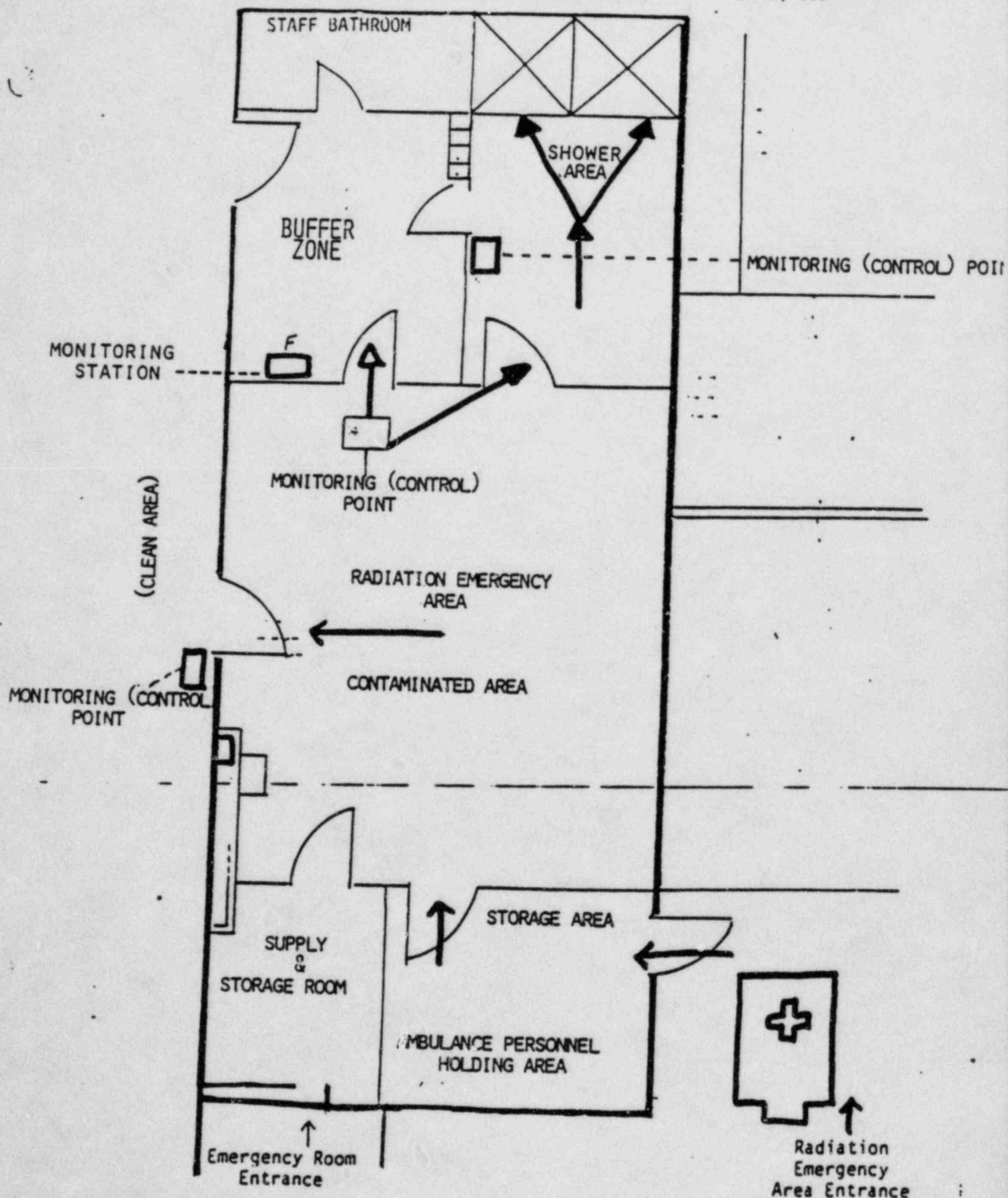
1. Multiple injuries occurring at Salem Nuclear Generating Station would be managed by utilizing the principles of disaster planning. These include triage at all levels of care and primary attention to life-threatening injuries. Radiation exposure and contamination should receive secondary consideration. Upon notification from Salem Nuclear Generating Station that there has been an accident involving more than one patient, complete the form seen under Attachment B, Data Information Sheet. In addition, inquire as to the extent of medical assistance available on-site. The Data Information Sheet should be given to the Emergency Room physician.
2. On-site medical personnel with the assistance of ambulance attendants should institute triage principles with primary attention to life-threatening injuries. The most seriously injured should receive priority evacuation. Minimum decontamination should include the removal of contaminated clothing. If time, availability of transportation and patients' medical condition warrant, further decontamination (e.g., bathing with soap and water) can be accomplished. Each contaminated patient sent to the hospital should be

H. PROCEDURE FOR HANDLING MULTIPLE VICTIMS (Continued)

- accompanied by a trained radiation technician. Less seriously injured victims should be completely decontaminated at the plant and be transported to the hospital in a "clean" ambulance to the normal emergency room entrance.
3. Prior to patient(s) arrival, Salem County Memorial Hospital should initiate its Disaster Plan for handling multiple casualties, as well as its procedure for handling contaminated and injured patients. The medical triage team should dress in protective clothing (see Attachment D). The present REA and/or Emergency Room area should be set up and ready to receive multiple contamination and injured patients.
 4. Upon arrival of the ambulance the triage team should have the most seriously injured and contaminated brought into the decontamination/treatment room. The less seriously injured should remain in the ambulance. A decontamination team should be assigned to begin decontamination in the ambulance. Contaminated clothing can be removed and collected and decontaminated areas can be wiped with a damp cloth. If decontamination cannot be completed, the areas should be covered with plastic or cloth.
 5. After the patients have been treated and decontaminated, the REA should be closed off; Salem Nuclear Generating Station personnel should survey and decontaminate hospital supplies, equipment, ambulances and the area prior to releasing it for routine usage.

AMBULANCE ACCESS ROUTE

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← Contaminated Medical Personnel Flow
- - - Clean Medical Personnel Flow
DIAGRAM

Revision: 2
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ATTACHMENT A

QUICK SORT PROCEDURE FOR HANDLING ANY
RADIATION ACCIDENT VICTIM

ATTACHMENT A

Procedure for Handling Any
Radiation Accident Victim at
the Emergency Room

1. Ascertain whether the patient is CONTAMINATED (Use Geiger Mueller Tube)
 - A. If so ... Admit the patient to REA Ambulance Entrance when set up as Radiation Emergency Area (REA)
 - B. If not ... Admit to normal Emergency Room
 - C. If in doubt ... Admit patient to REA
2. Treat traumatic injury.
3. If contaminated, decontaminate in REA
4. Call for assistance
 - Attending Staff, Emergency Room
 - Radiation Management Corporation (RMC):
 - Philadelphia (215) 243-2990 / (215) 841-5141
 - Chicago (312) 291-1030

PROCEDURE FOR ADMISSION OF UNANNOUNCED ACCIDENT VICTIM(S)
BY EMERGENCY ROOM PERSONNEL

Admission

Guidance is provided for the unannounced arrival of accident patients under two circumstances: (1) Emergency Room personnel become aware of the patient's status as a "radiation accident patient" before the patient has been removed from the ambulance; and (2) the patient has been brought into the Emergency Room before his status as a "radiation accident patient" has been determined.

Patient Still in Ambulance

If general medical condition warrants, sustain patient in ambulance, instruct driver, attendants, and Emergency Room personnel who have been in contact with the patient to stay in the vicinity of the ambulance (but not inside the ambulance).

ATTACHMENT A (Continued)

Patient Still in Ambulance (Continued)

Clean an area of about 8 feet around ambulance and keep unnecessary personnel and vehicles away. Attend to patient's medical condition as required. Use surgical gloves and mask. If immediate life-saving measures are not necessary, observe patient from a distance. All equipment and supplies used to attend to patient MUST stay in vicinity of the ambulance. DO NOT carry anything back to the Emergency Room.

Immediately request assistance from Salem Nuclear Generating Station and Radiation Management Corporation. Then:

- Request of Emergency Room staff that the Ambulance Entrance at the REA be set up as a Radiation Emergency Area;
- Clear every person out of REA before bringing patient in;
- Instruct driver to stay with ambulance until a radiation survey has been made;
- Bring necessary equipment and supplies to treat patient from Emergency Room to REA. All equipment, supplies and personnel entering REA MUST stay there until arrival of radiation monitoring personnel. Establish a guard at the door. Pass Emergency Room supplies and equipment into REA; but DO NOT allow personnel and equipment to come out; and
- Personnel attending patient in REA should stand next to patient only as long as necessary to perform life-saving measures. At all other times, stand about five to eight feet back and observe patient;
- Only persons attending the patient should be in the room.

Radiation Status Discovered After Admission to Emergency Room

- Immediately secure the entire area through which the patient has passed or is located. Keep all personnel and equipment in the area. DO NOT allow anyone or anything to leave;
- Establish a control point through which necessary personnel and equipment pass into restricted area;
- Make arrangements to admit other patients to uninvolved area of Emergency Room through the outpatient entrance.
- Attend to patient's emergency medical condition as required. Use surgical gloves, mask and gown when treating patient. If immediate life-saving measures are not necessary, observe the patient from a distance (five to eight feet). Immediately request assistance from Radiation Management Corporation or Salem Nuclear Generating Station (see Telephone Directory, Attachment I).

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ATTACHMENT B

TELEPHONE PROCEDURE FOR NURSING SUPERVISOR
AND
EMERGENCY ROOM NURSE

ATTACHMENT B

DATA INFORMATION SHEET

The Nursing Supervisor should obtain the following information from the caller:

Date and Time of Call: _____

Person Calling:

Name: _____

Address: _____

Telephone Number: _____

The Emergency Room Nurse will obtain the following:

Accident:

Location: _____

Date and Time: _____

Number of Patients: _____

Extent of Injuries: _____

Contamination Status: _____

Expected Time of Arrival: _____

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ATTACHMENT C
EMERGENCY TREATMENT OF
RADIATION ACCIDENTS

ATTACHMENT C

EMERGENCY TREATMENT OF RADIATION ACCIDENTS

GENERAL

Emergency treatment of radiation accidents may have to be given before contact with or arrival of specialists having expertise in evaluation and management of these accidents. In this case the management of the patient should take place in the following order:

- A. Resuscitation and Stabilization.
- B. Initial Decontamination.
- C. Evaluation of Radiation Status.
- D. Initial Treatment of Radiation Injury.

A. RESUSCITATION AND STABILIZATION

Since radiation injury is not immediately life-threatening, primary attention should always be directed to traumatic life-threatening injuries -- maintenance of airway, arrest of bleeding, treatment of shock and control of pain.

B. INITIAL DECONTAMINATION

Concomitantly with the procedure above, or as soon as possible, the patient should be decontaminated. In the initial decontamination

- Remove all clothing;
- Obtain samples of contamination (skin smears, tissue, fluids, etc.);
- Survey with a Geiger Mueller monitor and note levels of contamination on Patient Radiation and Medical Status Record Sheet (see Attachment J);
- Remove obvious dirt and debris; bathe, if necessary while protecting wounds;
- Repeat surveys and sampling as necessary;
- Flush wounds with copious amounts of sterile water and/or saline;
- Flush orifices with water or saline. Do not allow patient to swallow;
- Stop with initial decontamination when activity levels are measured in the few thousand counts/minute;
- See Attachment E for details on decontamination and sample taking.

ATTACHMENT C (Continued)

C. EVALUATION OF RADIATION EXPOSURE STATUS

History:

When did the accident occur?

Source of accident?

Type of radioisotopes involved?

How long was patient in accident environment? Where was he in relation to radiation source? Was there airborne contamination? Was the patient wearing breathing apparatus? Was there surface contamination? Any skin broken? Was source in contact with body? Was the patient wearing dosimeters?

Dose Evaluation:

This will require the assistance of persons knowledgeable in radiation. This assistance can be by someone on location or by telephone. In any case, gather as much of the following information as possible:

- Dose rate (gamma, x-ray, neutrons, etc.) as measured by instruments in accident environment;
- Radiation exposure reading on patients' and others' dosimeters (TLD, film badge, pencil dosimeter);
- Level of residual contamination (beta, gamma) on patient using survey meter (mark areas on Patient Data Sheet -- see Attachment J);
- Neutron exposure? Collect metal objects, hair or nails;
and
- Calculation of dose to the patient and to attendants.

ATTACHMENT C (Continued)

Clinical Picture: A good estimation of the severity of the patient's external, total body exposure can be obtained by observing the following clinical symptoms and signs:

- Nausea and vomiting ... ~ 100R*
- | | |
|--------------------------|-------|
| Beginning within 2 hours | >400R |
| Beginning after 4 hours | <200R |
| None within 24 hours | < 75R |
- Erythema ... >300R (total body); >600R (surface contact)
- Diarrhea ... >400R
- CNS symptoms ... >2000R to the head
- Serial lymphocyte count within 48 hours ...

1200/mm ³	good prognosis
300-1200/mm ³	guarded prognosis
300/mm ³	poor prognosis

*Rems, air exposure.

D. INITIAL TREATMENT OF RADIATION INJURY

Detailed Decontamination: It is particularly important at this stage to remove high level contamination caused by penetrating missiles or splinters in wounds.

Overexposure: Since overexposure to radiation results in a slowly unfolding course over a long period of time, there is little in the way of specific treatment in the initial stage of the disease. Treatment is symptomatic and consists of making the patient comfortable and allaying his fears. He may require anti-metetics, fluids, sedatives and analgesics.

Order CBC with differential stat, at 4, 8 and 12 hours. Obtain blood sample (10 cc sterile heparinized blood) for chromosome analysis. Keep sample chilled in ice water.

Internal Contamination: Except in a few instances, there is also little to offer in the way of specific treatment in the initial stages.

ATTACHMENT C (Continued)

Internal Contamination (Continued)

Generally, specific treatment to eliminate any absorbed radioactivity requires rather detailed and complex analyses, including bioassay of excreta and blood, and whole body counting. Begin 24 hour urine collections and 72 hour continuous fecal collections. Arrange for whole body count as soon as patient's condition warrants. Arrange for thyroid uptake study for I-131.

If it has been determined that an appreciable amount of radioactivity has been ingested (which is seldom the case), a stomach lavage, emetics (ZnSO_4) or cathartics ($10\% \text{MgSO}_4$) may be indicated.

If it has been determined that the patient absorbed considerable amounts of.....

Tritium (^3H).....force fluids
Radioiodine.....give Lugol's solution or other thyroid-blocking agent immediately (reduces thyroid uptake of I-131 by 50% if given within 4 hours post-exposure; probably not effective after 12 hours)

PRINCIPLES OF RADIATION PROTECTION

Certain precautions to minimize exposure to attendants are necessary when dealing with a patient who has external contamination, specifically:

- Always wear surgical scrub suits, masks, caps and gloves;
- As few attendants as necessary should be in the same room with patient;
- Only in the performance of emergency treatment and initial decontamination should attendants be next to patients. At all other times, e.g., while evaluating the patient, attendants should stand at least five to eight feet from the patient and observe him from a distance if radiation levels are excessively high;
- Rope off and control the area in which the patient is being treated. ALL persons, equipment and supplies that enter this area MUST stay there until Radiation Emergency Teams arrive to assist in the monitoring and decontamination of people and equipment;

Suggested permissible levels of attendant exposure in the course of treating a patient are:

TOTAL	to 5R routine treatment and decontamination
BODY	to 25R emergency treatment and decontamination
EXPO-	to 100R lifesaving treatment and decontamination
SURE		

ATTACHMENT C (Continued)

Principles of Radiation Protection (Continued)

To estimate beta exposure use disc shaped monitor handle covered with plastic glove and pass over body approximately 1 inch from surface. If the reading is 5R/hour, an estimate of attendant exposure would be 5R; treatment should take one hour. Experience shows that it is extremely unlikely that an accident would be so severe that an attendant would receive an exposure of even 5R. In high radiation fields personnel may be rotated in order to minimize the exposure to any single individual. It is also suggested that anticipated exposures over 5R should be on a voluntary basis.

INITIAL BIOASSAY SAMPLES

Each of the following bioassay samples should be obtained as soon as possible and labeled with name, date, time and type of specimen. Avoid cross-contamination of samples from external sources of contamination or from other samples.

Blood:

- 1) 10 cc for radiobioassay;
- 2) 5 cc (sterile heparinized) for chromosomes; keep samples chilled in a glass of ice;
- 3) 10 cc oxylated for hemogram and differential*
- 4) 10 cc for:
 - a) chemistries;
 - b) electrolytes

Hair, nails, metals from neutron-exposed patient;

Urine:

- 1) first urine;
- 2) 24 hour urine for several succeeding days

Feces, total sample for several succeeding days;

Sputum;

Vomit;

Tissue and tissue exudates (note location);

Irrigation fluids (note location); and

Filter paper or cotton smears of orifices, wounds, skin areas (note locations).

*differential - repeat t.i.d. for 3 days or more frequently if clinical solution warrants.

Revision: 0
December, 1980

ATTACHMENT D
PROCEDURE FOR THE
USE OF PROTECTIVE CLOTHING AND DOSIMETERS

ATTACHMENT D

PROCEDURE FOR THE USE OF PROTECTIVE CLOTHING AND DOSIMETERS

All work past the Monitoring (Control) Point requires protective clothing, independent of the degree of contamination present on the patient or his clothing. Each person entering REA should don two surgical gowns, two sets of surgical gloves, and two vinyl aprons, mask, cap and shoe covers, as well as dosimetry. (See Diagram III for donning protective clothing and proper placement of attendant dosimetry). After gross decontamination is completed, the outer surgical gown, gloves and apron are removed. Wound care and decontamination will then be attended to.

Removal of Contaminated Protective Clothing

Upon completion of their activities in the Radiation Emergency Treatment Room personnel will proceed to the Monitoring (Control) Point between the Treatment Room and the Buffer Zone (Diagram III). They will remove their protective clothing and personnel dosimeter in the following order:

- (1) self-reading dosimeters (read and recorded by Control Point Attendant);
- (2) headwear and mask;
- (3) apron and gown (turning them inside-out);
- (4) footwear and gloves (removed at Step-Off Pad).

Clearance Procedures

After having removed protective apparel, each person who occupied the Treatment Area will be monitored prior to leaving the Buffer Zone. If no contamination is found, personnel may proceed to the change area and put on their normal clothing.*

*If contamination is found, personnel will remain in the Buffer Zone, away from the normal exit. Salem Nuclear Generating Station personnel will direct them through a decontamination process utilizing the water supply, soap and water collection system available in the treatment room. A final survey will be performed at the control point prior to entering the clean part of the hospital.

Use of Dosimeters

Dosimeters will be supplied by the Monitoring (Control) Point Attendant to all personnel entering the Radiation Emergency Area.

ATTACHMENT D (Continued)

Use of Dosimeters (Continued)

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 they are distributed to each attendee.
2. Badge dosimeters - to form a permanent record of exposure.
3. Ring dosimeters - to form a permanent record of finger exposure.

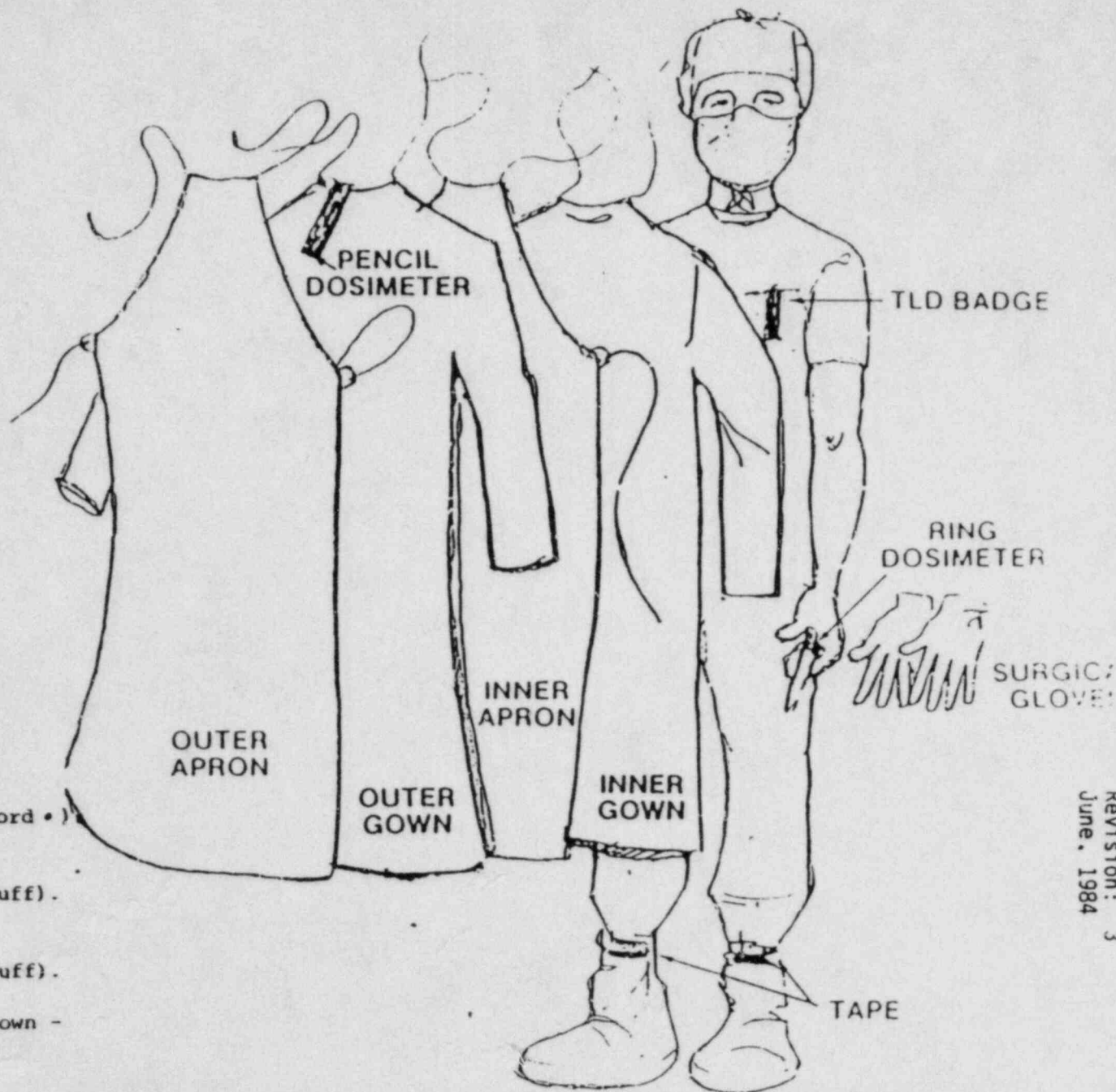
Dosimeters are to be worn in the following manner:

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.

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. 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.



Radiation Management Corporation
3508 Market St
P O Box 7940
Philadelphia, Pennsylvania 19101



ATTENDANT GARB DRESSING SEQUENCE

1. Scrub suit.
2. Protective Shoe Covers.
3. Ring TLD (Record •).
4. Badge TLD (On Shirt Pocket - Record •).
5. 1st Gown.
6. 1st Apron.
7. 1st Pair Gloves (Over 1st Gown Cuff).
8. 2nd Gown.
9. 2nd Apron.
10. 2nd Pair Gloves (Over 2nd Gown Cuff).
11. Cap and Mask.
12. Self Reading Dosimeter (On 2nd Gown - Record • • Zero).

Revision: 3
June, 1984

DIAGRAM III

Revision: 2
March, 1984

ATTACHMENT E

PROCEDURE FOR
PATIENT DECONTAMINATION AND SAMPLE TAKING

ATTACHMENT E

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.

Attachment F provides a parts list for each of the two kits. 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.

Patient Decontamination Procedures

Principles

The objectives of decontamination are:

1. to prevent injury caused by the presence of radioactive substances on the body;
2. to prevent the spread of contamination over and into the patient; and
3. to prevent 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 material 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 skin only, and 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).

ATTACHMENT E (Continued)

Patient Decontamination Procedures (Continued)

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).

Decontamination Procedures

In some cases decontamination may have been started before the patient arrives at Salem County Memorial Hospital. The extent of decontamination will be dependent upon the injury or illness.

A. General

Two general rules apply to the performance of decontamination:

1. Check the effectiveness of the technique applied by monitoring periodically; and
2. Avoid the spread of radioactive materials from the area being decontaminated to areas of lesser contamination by covering the adjacent area.

Decontamination sequence should proceed as follows:

1. Wounds and adjacent skin;
2. Body orifices and adjacent skin;
3. High level intact skin;
4. Low level skin areas.

B. Steps To Be Taken For Decontamination and Sample Taking

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 Salem Nuclear Generating Station personnel 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;

ATTACHMENT E (Continued)

Decontamination Procedures (Continued)

B. Steps To Be Taken For Decontamination and Sample Taking (Continued)

3. Remove all clothing and monitor the patient with the radiation survey instrument by scanning the entire body (holding the probe about 1/2 inch from the skin), and record the findings on the Patient Data Sheets;
4. Obtain patient samples in accordance with Procedures for Sample Taking, which follow. COLLECTION OF SAMPLES SHOULD BE PERFORMED PRIOR TO DECONTAMINATION;
5. Perform a gross decontamination (see Decontamination of Skin and Body Orifices which follow);
6. Clean up room and remove outer garments from attendants;
7. Proceed with wound survey and decontamination (see Procedures for Decontamination of Wounds);
8. Complete detailed decontamination of patient;
9. Transfer patient to "clean" area of hospital (see Diagram IV).

Waste material will be appropriately collected and returned to Salem Nuclear Generating Station for disposal.

C. Decontamination of Skin

1. Take smear sample of area (see "Sample Taking Techniques and Indications");
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 running water; monitor; record results;
*Assure that the water being used to decontaminate the patient is being collected in the proper radiological container.
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 abraded 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 skin and apply colloidin, mark the area involved and record;

ATTACHMENT E (Continued)

Decontamination Procedures (Continued)

8. Collect all materials used and place in separate labeled containers.

NOTE: 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 retain; scrub thoroughly and repeatedly with intermittent surveying.

D. Decontamination of Body Orifices

1. Take samples of activity in nostrils, ear canals, and other orifices as indicated (see "Sample Taking Techniques and Indications");
2. Decontaminate area surrounding orifices;
3. Gently clean orifices using wetted swabs;
4. If nose swab indicates significant radioactivity in nasal cavity, use nasal blows and nasal irrigation;
5. Collect all materials used and label containers.

E. Decontamination of Wounds

1. Use aperature 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 minitor wound; record results on patient record sheet;
7. If contamination persists, consult with RMC to determine further course of action;
8. If wound is clean, treat wound as necessary.

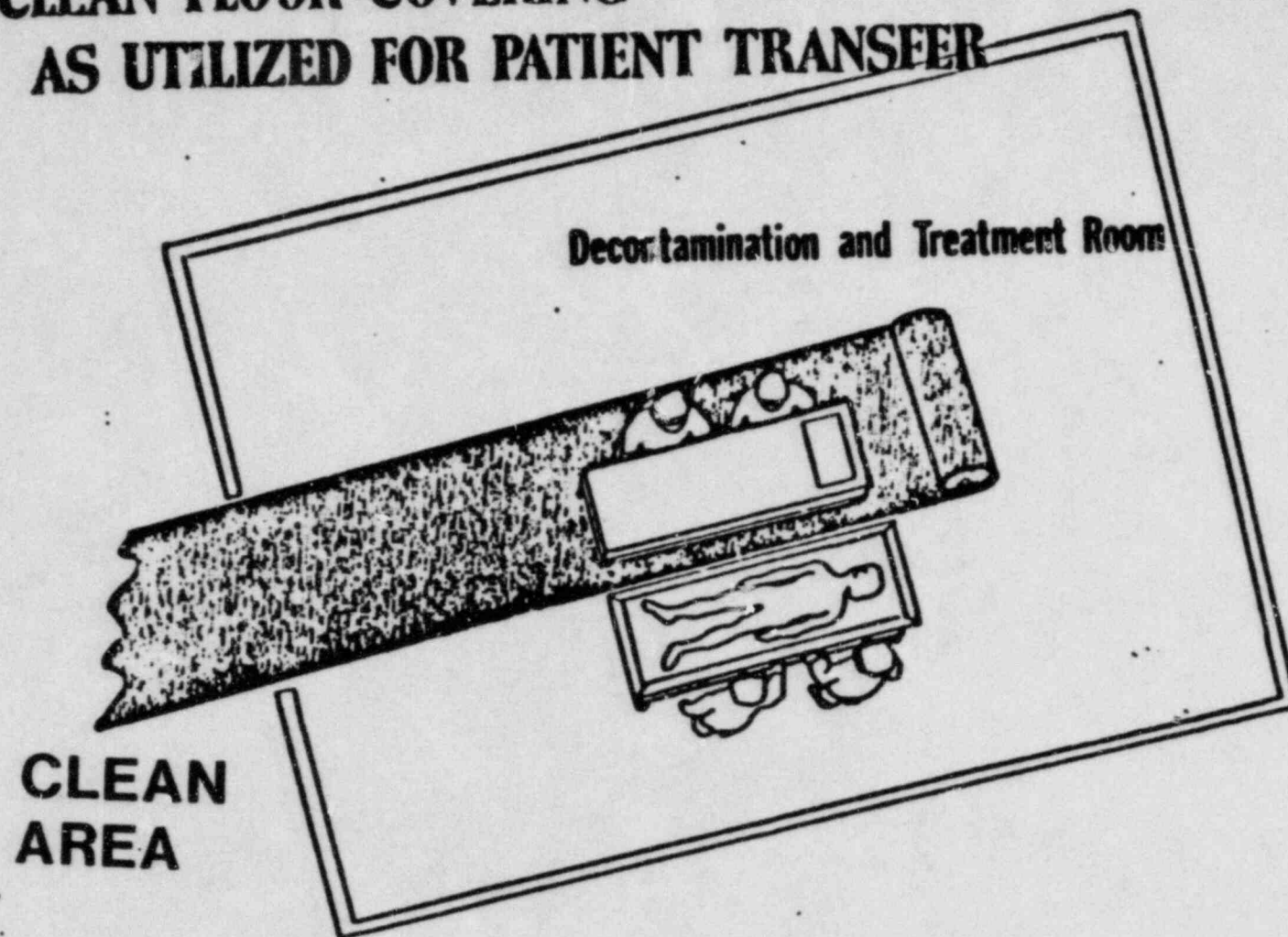
Procedures for Sample Taking

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; and

CLEAN FLOOR COVERING AS UTILIZED FOR PATIENT TRANSFER



Revision: 1
June, 1984

ATTACHMENT E (Continued)

Procedures for Sample Taking (Continued)

3. To supply information on the biological injury inflicted by the radiation.

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).

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 activity (such as cleansing fluids, drapes, towels, etc.).

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.

Sample Taking Techniques and Indications

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 cm² (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 cm² and place in envelope. Alternatively, tape may be used to remove contaminants for later examination.
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:
 - for large wounds with visible blood or wound fluid -- obtain a few cc using an eye dropper or syringe; transfer to bottle and label;
 - for superficial wounds -- rub gently with cotton swabs; return to tube and label;

ATTACHMENT E (Continued)

Sample Taking Techniques and Indications (Continued)

External Contamination (Continued):

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

Internal Contamination:

1. Body Orifices: wet Q-tip with a 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.

In all cases where a total body exposure is expected:

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.

NOTE: Return bioassay samples to kit. With any specimens necessary to the emergency medical treatment of the patient which are obtained prior to completion of decontamination and are to be processed in the hospital laboratory, be sure to clean the outside of the specimen container (test tube, etc.) and have it surveyed before handing it out to the buffer zone attendant.

Revision: 0
December, 1980

ATTACHMENT F

PARTS LIST FOR DECONTAMINATION AND SAMPLE TAKING KITS

ATTACHMENT F
DECONTAMINATION KIT

	<u>Quantity</u>
<u>Skin Decontamination</u>	
Absorbent Balls, extra large	1 box
Sponge-holding forceps	1
Plastic Beaker, large	2
Preop Sponges	6
Surgical Scrub brushes	10
Wash Bottle (for localized contamination)	1
<u>Decontaminants (Skin Only)</u>	
Turco decon soap, bottle (for first decon effort: general)	1
Clorox, bottle (for second decon effort)	1
Hydrogen Peroxide (H ₂ O ₂), bottle* (for third decon effort)	1
*shelf life - three years	
<u>Wound Cleansing</u>	
Gauze pads, sterile	50
Sterile Surgical Gloves, assorted sizes	8 pair
Solution bowl, plastic	1
Syringe, 50 cc	1
Cotton-tipped applicators	100
Aperature Drape	1
<u>Decontaminants (Wounds)</u>	
Saline Solution, normal*, sterile bottle	1
Betadine Surgical Scrub bottle	1
<u>Treatment Agents</u>	
Nivea cream, jar	1
Colloidin, bottle	1
*shelf life - two to three years	

ATTACHMENT F (Continued)
DECONTAMINATION KITS (Continued)

	<u>Quantity</u>
<u>Miscellaneous Materials</u>	
Prep Kit	1
Scissors, heavy duty	1
Patient Radiation and Medical Status Anatomical Diagram	12
Plastic bags, assorted sizes (to hold decon materials after use)	8
Tissue paper, box	1
Notebook	1
Pencils	2
Finger-Nail Clippers	1

<u>SAMPLE TAKING KIT</u>		<u>Quantity</u>
<u>Sample Type</u>	<u>Sampling Instrument</u>	
Nasal	swabs	4
Aural	swabs	4
Oral	swabs	4
Skin Folds	swabs	4
Swipes	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 (24 hour)	2000 cc plastic container	1
Feces	fecal container	2
Wound Exudate	swabs eyedropper & bottle	4 2
Tissue	containers	2 small - 2 medium
Vomit	fecal container	2
Irrigation fluids	100 cc plastic bottle	2

ATTACHMENT F (Continued)

SAMPLE TAKING KIT (Continued)

<u>Miscellaneous Items</u>	<u>Quantity</u>
Envelopes	10
Labels	50
Pens	1 grease 1 writing
Scissors	1
Tweezers	1
Clippers	1

Revision: 2
March, 1984

ATTACHMENT G

REA STORED SUPPLIES & EQUIPMENT

Revision: 3
June, 1984

INVENTORY OF THE RADIATION EMERGENCY MEDICAL SUPPLIES & EQUIPMENT

Salem County Memorial Hospital

February 8, 1984

<u>ITEM</u>	<u>QUANTITY</u>
Decontamination kit, complete w/ instructions	1
E-Z Prep	
Hydrogen Peroxide	
Sodium Chloride Solution	
Betadine	
Sample Taking Kit, complete w/ instructions	1
Decontamination Table Top complete w/splash guards and stretcher insert	1
Barrel, 20 gal., mobile, white plastic	1
Barrel, 32 gal., w/mobile base	3
Herculite, white, green, yellow	sufficient
Lead pig	1
Poster, "Radiation Accident" (1 framed)	1
Poster, CPR	1
Paper, brown kraft, roll	1
Rope, yellow/magenta	sufficient
Shield, mobile, lead glass	1
Showerhead w/hose	1
Sign, radiation warning w/inserts	9
Sign, "Caution Radiation Area", metal	1
Step-off pad	2
Tape, masking, 2"	2

2-

<u>ITEM</u>	<u>QUANTITY</u>
<u>INSTRUMENTS:</u>	
Charger, dosimeter - Johnson Model CAT 6 S/N 24	1
Dosimeter, SRD, 0-1 R	9
Geiger Counter Eberline Model E-520 S/N 3107	1
Count Rate Meter Eberline Model E-140N S/N 1090; S/N 1086	2 each
Constant Flow Air Sampler RADECO Model HD 29A S/N 0582	1
Glass Filter 47 mm	sufficient
Radiation Monitor with HP210 Probe RMC Type Eberline Model RM-14, S/N 3999	1
TLD, control	1
TLD, badge	10
TLD, ring	10
NOTE: Instruments maintained and calibrated by plant	
<u>EQUIPMENT:</u>	
Air vent plugs	5
Ambu resuscitator	1
Bucket, mobile, stainless steel	1
IV Stand	1
Mayo Stand	1
Oxygen resuscitator, wall-mounted	2
Resuscitator, manual	1

June, 1984

- 3 -

<u>ITEM</u>	<u>QUANTITY</u>
Sphygmomanometer, wall-mounted	2
Surgical lamp, ceiling-mounted	1
Waste receptacle, metal	1
Gurney	1
Clock, wall-mounted	1
<u>CLOTHING/LINEN SUPPLIES</u>	
Apron, plastic, box	1
Gloves, surgeon's	sufficient
Protective Clothing Packs: (RMC type)	12
Aprons (2)	
Cap (1)	
Gloves, surgeon's (2) pr	
Gowns (2)	
Mask (1)	
Shoe Covers, yellow (1) pr	
plastic	
<u>MEDICAL SUPPLIES:</u>	
Specimen storage container	5

Revision: 4
March, 1984

ATTACHMENT H

RADIATION EMERGENCY TELEPHONE DIRECTORY

ATTACHMENT H

RADIATION EMERGENCY TELEPHONE DIRECTORY

<u>Salem County Memorial Hospital</u>	<u>Day</u>	<u>Night</u>
Emergency Room	609-935-1000 Ext. 231	
J. Michael Galvin President	609-925-1000 Ext. 201	609-299-0079
Alberta Clour, R.N. Vice President/Nursing	609-935-1000 Ext. 255 or 379	609-935-6515
Joanne Brodrick, R.N. In service Education Coordinator	609-935-1000 Ext. 246	609-468-5496
William L. Wilson Director, Plant Operations	609-935-1000 Ext. 324	609-935-2047
Paul Fredricks Sr. Vice President	609-935-1000 Ext. 207	609-678-3654
Lawrence B. Owen, M.D. Chief of Staff	609-935-1000 Ext. 326	609-678-3212
<u>Public Service Electric & Gas Company, 80 Park Place, Newark, NJ 07101</u>		
Bernard Reilly, M.D. Medical Director	201-430-5930	201-744-2476
Ronald J. Mack, M.D. Manager of Dispensaries Assistant Medical Director	201-430-5939	201-773-9235
<u>Coordinating Physicians</u>		
John R. Castiglioni, D.O.	609-935-1000 Ext. 231	609-769-3152
Gordon J. Ostrum, M.D.	609-769-0226	609-769-0460
Lawrence B. Owen Chief of Staff	609-935-1000 Ext. 326	609-769-3212
John Madara, M.D. 31 Market Street Salem, NJ 08079	609-935-1477	609-935-2220
Harry W. Fullerton, Jr., M.D.	609-299-0345	609-299-4910

ATTACHMENT H (Continued)

RADIATION EMERGENCY TELEPHONE DIRECTORY (Continued)

<u>Ambulance Service</u>	<u>Day</u>	<u>Night</u>
Lower Alloways Creek Ambulance	609-935-4222 (General Bus.)	609-935-4505 (Emer. #)
Elsinboro Fire & Rescue	609-935-2814	609-935-2814
Norman Davis, EMT Coordinator Woodstown Ambulance/Rescue	609-935-1000 Ext. 304	609-769-0818
<u>Salem Nuclear Generating Station</u>		
John Zupko Plant Manager	609-935-6000 Ext. 4300	
Jim O'Connor Radiation Protection Engineer	609-935-6000 Ext. 4645	
Paul Eldreth Nuclear Fire & Safety Engineer	609-935-6000 Ext. 4572	
Pete Moeller Manager, Site Protection	609-935-6000 Ext. 4400	609-468-4737
Wayne L. Britz Manager, Radiation Protection Services	609-935-6000 Ext. 4546	609-935-4334
<u>Radiation Management Corporation</u>		
Emergency: PRIMARY	215-243-2990	
SECONDARY	215-841-5141	
GENERAL BUSINESS	215-243-2950 (Philadelphia)	
	312-291-1030 (Chicago)	

Revision: 3
March, 1984

ATTACHMENT I
LOCATION OF MANUALS

ATTACHMENT I

LOCATION OF MANUALS

<u>Manual Number</u>	<u>Location</u>
	<u>Radiation Management Corporation</u>
1	Philadelphia Office
	<u>Salem Nuclear Generating Station</u>
2 <i>Waggle</i>	Manager, Radiation Protection Services
3 <i>Waggle</i>	EOF Locker
4 <i>J. O'Connor</i>	Radiation Protection Engineer
5 } <i>Henry Jones</i>	Nuclear Department, Safety Supervisor
6 }	First Aid Room
7 }	Security Emergency Locker
	<u>Salem County Memorial Hospital</u>
8	President
9	Senior Vice President
10	Radiation Emergency Area
11	Vice President/Nursing
12	Nursing Supervisor
13	In service Education Coordinator
14	Chief of Staff
17	Radiology
18	Plant Operations Director
	<u>Coordinating Physicians</u>
15	Gordon J. Ostrum, M.D.
	<u>Public Service Electric & Gas Company</u>
16	Medical Director

Revision: 0
December, 1982

ATTACHMENT J
PERSONNEL DOSIMETRY LOG
AND
PATIENT DATA SHEETS

PERSONNEL DOSIMETRY LOG

December, 1982

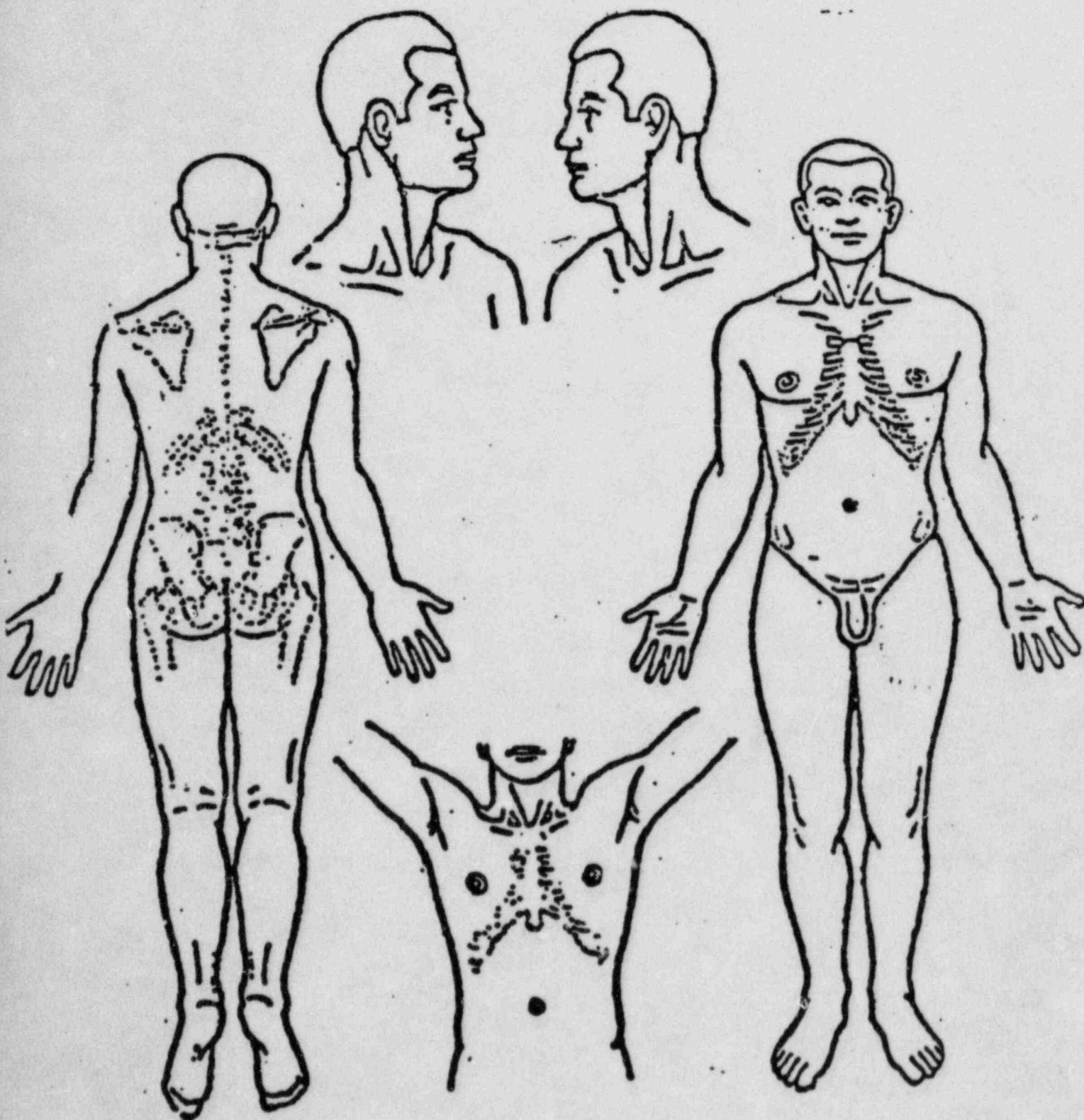
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Signature
(CONTROL POINT ATTENDANT)

PATIENT NAME _____ DATE _____ TIME _____ SURVEY # _____

Directions: indicate levels of
contamination on
the corresponding body part.

Revision: 1
October, 1984



Surveyed by: _____
Reviewed by: _____

Calibration date: _____