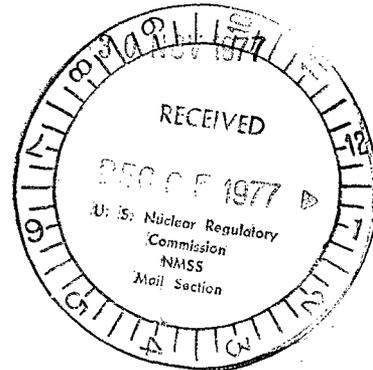




DEPARTMENT OF THE ARMY  
HEADQUARTERS UNITED STATES ARMY ELECTRONICS COMMAND  
FORT MONMOUTH, NEW JERSEY 07703

DRSEL-RD-H

SUBJECT: Emergency Procedures



Chief  
Radioisotopes Licensing Branch  
Division of Fuel Cycle and Material Safety  
US Nuclear Regulatory Commission  
Washington, DC 20555

1. References

a. Letter, your Hq, dated Oct 25, 1977, to all licensees authorized to perform in-air irradiations, subject: Emergency Procedures.

b. NRC Byproduct License 29-01022-07.

2. Attached as inclosure 1 is the text of a sign which is conspicuously posted in the control room of the irradiation facility. This fulfills requirements 1 and 2 of your letter, ref la.

3. Attached as inclosure 2 is a copy of emergency procedures for the First Aid Squad. This fulfills requirement 4 of your letter, ref la, and supplements inclosure 1 in fulfilling requirement 1.

4. Attached as inclosures 3 and 4 are copies of emergency procedures of Patterson Army Hospital which is the primary medical facility which will be used in the event of an emergency at the irradiator facility. This Hospital is located about 30 minutes from the facility. Attached as inclosure 5 is chap 7 of TM 8-215 which is a reference of inclosure 3. These inclosures fulfill requirement 3 of your letter, ref la.

5. In addition to Patterson Army Hospital a secondary medical facility, Jersey Shore Medical Center, is located about 10 minutes from the irradiator facility. In the event of an emergency where a few minutes delay might be vital, a verbal agreement has been made with Jersey Shore Medical Center that they will accept patients, even if radiologically contaminated. They will perform any emergency procedures that might be called for and will either accept the patient for check-in, or will transport the patient to Patterson Army Hospital by helicopter, whichever would benefit the patient more. This agreement supplements emergency procedures of Patterson Army Hospital in fulfilling requirement 3 of your letter, ref la.

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DRSEL-RD-H  
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6. If the information submitted herewith is inadequate in any way, please let us know what more is required and we will be happy to supply it.

FOR THE COMMANDER:

5 Incl  
as

*Walter S. McAfee*  
WALTER S. McAFEE  
Scientific Adviser  
to Director, RD&E

CF:  
DRCSF-P  
DRSEL-SF  
DRSEL-RD-O  
DRSEL-RD-H

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In the event of suspected or known Radiation overexposure of personnel the following procedures are to be carried out.

1. The vault will be evacuated immediately.
2. The First Aid Squad will be called. (65416)
3. The Radiological Protection Officer will be notified. (65292)

*Incl 1*

FIRST AID SQUAD  
EMERGENCY PROCEDURES

In responding to suspected or known radiation overexposure of personnel the following procedures are to be carried out.

1. Until there is positive assurance to the contrary it will be assumed that the patient is radiologically contaminated and appropriate procedures will be implemented to keep the contamination from being spread.
2. The patient will be taken to Patterson Army Hospital by ambulance and will be checked in for treatment and/or observation.
3. In the event of accompanying injury where a few minutes delay in hospitalization might be vital, the patient will be taken to Fitkin Hospital.

91432

Incl 2

# DISPOSITION FORM

For use of this form, see AR 340-15, the component agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL

SUBJECT

AHDD-HE

Emergency Procedures for Personnel Overexposed  
to Radiation

TO Chairman  
ECOM, IRCC

FROM Chief  
HEV Actv  
USAMEDDAC

DATE 29 Nov 77 CMT 1  
si/22579

1. Per discussion with LTC Good, Executive Officer, Patterson Army Hospital, instructions will be published which will direct Emergency Room personnel to hold for observation persons who are overexposed to radiation but are uncontaminated as a result of the exposure. Appropriate medical treatment and follow-up will be provided as necessary.
2. These instructions will be published as an addition to the Emergency Preparedness Plan or as separate instructions as determined by the Chief, Plans and Operations at Patterson Army Hospital.

*Charles C. Boger, Jr.*  
CHARLES C. BOGER, JR.  
CPT, MSC  
C, HEV Actv

10 SEP 06

ANNEX L (HANDLING OF RADIOACTIVE CONTAMINATED PATIENTS)  
EMERGENCY PREPAREDNESS PLAN

1. PURPOSE. The purpose of the plan is to set forth the procedures to be followed in case of radiation accidents.

2. SCOPE. This plan is applicable to the Emergency Room personnel, the Administrative Officer of the Day, the Adjutant and Radiation Protection Officer.

3. RESPONSIBILITIES:

a. Persons receiving call.

(1) In addition to the routine information sought, the person receiving the call should inquire about the type of the radioactive contaminant and level of contamination remaining after initial contamination at the scene of the accident.

b. Emergency Room Personnel should notify:

(1) Adjutant (21043) during duty hours  
AOD after duty hours

(2) MOD

(3) Radiation Protection Officer (Environment Science Officer).

c. Emergency Room Personnel:

(1) The guidelines set forth in TM 8-215, Chapter 7 in particular, should be followed as appropriate.

(2) Contaminated patients will be brought in the entrance to the immediate left of the emergency entrance and placed in the holding area at the rear of the emergency room area.

(3) All patients, personnel and material leaving this area must be checked for contamination by the Radiation Protection Officer or his assistant.

(4) Access to the patient treatment area will be limited to the personnel necessary to provide treatment.

*Level 4*

(5) All waste and contaminated material will be held for disposal by Medical Supply.

(6) Lifesaving measures will take precedence over patient decontamination.

(7) Pregnant personnel will not be assigned to radiation injury patients.

d. It will be the responsibility of the Radiation Protection Officer to perform the necessary monitoring of radiation.

e. Ambulance and Emergency Room personnel sent to the scene of a nuclear accident will:

(1) Report to the Nuclear Accident/Incident Control Officer (NAICO) or on-scene commander to receive the situation briefing as to the presence of casualties, the type of accident and whether the accident has a potential for creating a radioactive contamination hazard.

(2) Ascertain from the NAICO or on-scene commander the requirements for individual protective measures to be taken by rescue and medical personnel against potential hazards from high explosives and radioactive or other hazardous materials.

(3) Prepare casualties for early evacuation. Take simple and feasible but not unreasonable time-consuming decontamination measures (e.g., removal of shoes, external clothing, etc., weather permitting) to minimize the spread of contamination to transport vehicles or treatment facilities.

f. Mass Casualty Recall should be initiated by the AOD if the number of casualties is too great for the staff on hand to manage.

4. REFERENCE:

a. TM 8-215

## CHAPTER 7

### MEDICAL MANAGEMENT OF PATIENTS IN NUCLEAR WARFARE

#### 32. General

The successful early management of patients depends upon the exercise of sound judgment in the following basic areas:

- a. Medical sorting of patients (Triage).
- b. Treatment. This should be directed toward providing maximum benefit to the greatest number under the circumstances while avoiding any procedure which would unwarrantably reduce the patient's ability to care for himself.
- c. Utilization of medical service personnel. Medically trained individuals must be used efficiently and should not be diverted to first aid, rescue, transportation, or nonmedical labor functions.
- d. Flexibility of the supporting medical facility to respond and adapt to rapidly changing circumstances.
- e. Rigorous supply conservation.
- f. Evacuation of casualties.
- g. Planning and training. Preparation for the management of patients in nuclear warfare must be based on a knowledge of nuclear weapons effects and sound medical practices. Training must be practical rather than theoretical.

#### 33. Medical Sorting

a. Medical sorting or triage is the key to the effective management of large numbers of sick and wounded. It includes the immediate classification of patients according to type and seriousness of injury and likelihood of survival, and the establishment of priorities for treatment and evacuation to assure medical care of the greatest benefit to the largest number. Sorting permits the orderly, timely, and efficient utilization of available medical means. It is a continuous process, carried out at each echelon of medical care as patients are evacuated rearward. The critical importance of sorting demands that medical officers assigned this responsibility be selected on the basis of mature professional judgment.

b. Criteria for the classification of patients will vary with the military situation, the patient load, and the capability of the medical unit involved.

The following is a classification of patients according to their need for medical care and chance for survival:

(1) *Patients requiring Minimal treatment:* Those who may be returned to duty include those who have: 1) small lacerations or contusions, 2) simple fractures of small bones, 3) second-degree burns of less than 10 percent extent but not involving face or hands, or who have received, 4) short term body ionizing radiation doses of 100 to 150 rads. The second group includes non-effective persons who need minimal nursing care for: 1) disabling minor fractures; 2) burns of the face or hands which interfere with the person's ability to care for himself; 3) moderate neuropsychiatric disorders, or, 4) early symptoms of nausea and vomiting due to short term whole-body ionizing radiation doses of 150 rads or less. These patients truly have no priority for treatment but in practice would receive some treatment when first seen. Ordinarily, their wounds and diseases would be such that the treatment they receive while being sorted is all the treatment they would require, and they could then be returned to duty or sent to a facility for minimal nursing care. This group could constitute up to 40 percent of the total injured.

(2) *Patients requiring Immediate Care.* Included as patients requiring immediate care are those with: 1) hemorrhage from an easily accessible site, 2) rapidly correctible mechanical respiratory defects, 3) severe crushing wounds of the extremities, 4) incomplete amputations, 5) severe lacerations with open fractures of major bones, and 6) severe burns of the face and upper respiratory tract necessitating tracheotomy. The patients in group 2 will be given the highest priority for surgical treatment because a relatively short procedure could save life or limb. More definitive surgery would be delayed to a later date. An increased rate of complications and permanent disability would have to be accepted. This group is expected to comprise about 20 percent of the total injured.

(3) *Patients whose surgical treatment may*

*be Delayed.* Persons whose surgical treatment can be delayed without immediate jeopardy to life include those with: 1) simple closed fractures of major bones, 2) moderate lacerations without extensive bleeding, 3) second-degree burns of 10 percent to 25 percent and third-degree burns of 10 percent to 15 percent of the body surface (after body fluid levels have been stabilized), and 4) noncritical central-nervous-system injuries. This group is composed of patients for whom a delay in treatment might lead to complications but whose lives would not be unduly jeopardized by delay. The amount of delay between wounding and surgery for this group depends on the total number of patients with higher priorities who need treatment and the medical facilities available. This group may comprise about 20 percent of all injured.

(4) *Patients whose treatment would be on an extended delayed basis (Expectant).* These patients include those with: 1) critical injuries of the central nervous system or respiratory system, 2) penetrating abdominal wounds, 3) multiple severe injuries, 4) severe burns of large areas (30 percent or above), or 5) known lethal or supralethal doses of total body radiation. The treatment for group 4 patients would consist of that resuscitation and emergency medical treatment which the available facilities, total supplies, and number of professional personnel permit. They would have the lowest priority for surgery because the operative procedures required would be time consuming and technically complicated, so that an operation on one of these patients would theoretically jeopardize the lives of several in other higher priority groups. The more rapidly patients in other treatment categories are treated and moved, the sooner more definitive treatment could be started on the injured in category 4. It is anticipated that this group will comprise about 20 percent of all injured.

c. The percentages noted above for each classification may vary considerably in a specific instance during nuclear warfare, depending on a multitude of factors including the physical environment, orientation of the personnel, weapon employment, time of day, presence or absence of fallout, and many other variables.

### **34. Handling the Radioactively Contaminated Patient**

a. Patients who have been in fallout areas may have varying amounts of radioactive contamination on their skin and clothing. The contamination will be in the form of fission products which have become absorbed on the surfaces of dirt or dust

particles of varying sizes. The patient himself will not be radioactive, but he will suffer radiation injury (beta burns) from the contamination unless it is removed early. In addition, as the patient is handled, much of the contamination will be scattered about, contaminating other people and the surroundings. The objective of proper decontamination is to control the removal of this hazardous material from patients, restricting it to defined areas. This will allow proper handling of contaminated equipment and clothing and will reduce the hazard to other personnel.

b. It is important to bear in mind the distinction between contaminated patients and radiation injured patients. Patients who have received substantial doses of radiation and who subsequently exhibit clinical manifestations of the acute radiation syndrome are not necessarily contaminated. Likewise, patients who are contaminated have not necessarily received substantial doses of radiation. Mere exposure to radiation does not result in a contaminated casualty. Only when substances emitting radiation are deposited upon, or become attached to, the patient or his clothing is the patient radiologically contaminated.

c. The presence of fallout contamination upon a patient represents by far a greater hazard to the patient himself than it does to the personnel caring for him. The duration of the exposure, the quantity of contact contamination, the distance between the source and those exposed, and the geometry of the radiation exposure all combine to maximize the danger to the patient while minimizing that to those around. Further, if the medical facility which receives the contaminated patients is itself in a fallout area, the high gamma environment and its threat to all patients and medical personnel would far outweigh any hazards from handling contaminated patients.

d. Fear that the gathering of large numbers of heavily contaminated patients in or around a medical facility is hazardous is unfounded. The only hazard from radioactive contamination which can cause injury at any distance in air is gamma radiation. It would be very difficult to get enough patients crowded together to constitute a significant gamma hazard. If all the radioactive contamination from many heavily contaminated patients was collected in one small area of a few square meters, a minor hazard could result, but the patients themselves will not present a gamma hazard.

e. The major hazard associated with handling contaminated patients is the possibility of beta burns caused by transfer of the radioactive material from the patients to the unprotected skin

surfaces of other personnel. Though this hazard is not a lethal one, it could result in the incapacitation of medical personnel from the burns if the material is not removed from their skin.

f. In order to handle the radiologically contaminated patients properly, it is first necessary to detect contaminated patients. The only way to detect radioactive contamination is by proper monitoring with radiac instruments. Since the levels of radiation to be dealt with are rather low and the governing hazard is beta radiation, a Geiger-Mueller counter such as the AN/PDR-27 should be used to monitor incoming patients for contamination. As a general rule, if the reading is twice current background radiation or higher, the patient should be considered contaminated.

g. Incoming patients should be monitored at any time there is any reason to believe that contaminated patients are arriving at the medical facility. (Possible indications: reports from ambulance drivers, messages from another hospital or a headquarters, sighting of a nuclear burst or cloud.) Otherwise, patients may be "spot checked" every 15 minutes or every five or six patients. This monitoring need not be carried out at a great distance from the medical facility. It can be accomplished within or just outside the admission area. The only requirement is that it be done if at all possible prior to admission of the patient to the facility. Once it has been confirmed that the patient is contaminated, decontamination is easily accomplished. The simple removal of all outer clothing and a brief washing or brushing of the exposed skin surfaces will achieve a high degree of decontamination without subjecting the patient to the trauma of vigorous bathing and showering. These simple tasks can be accomplished prior to admission or later on the ward or elsewhere in the medical facility depending upon the condition of the patient. *The radiological contamination of the patient should not be allowed to interfere with immediate life saving treatment or the best possible medical care.* However, whenever decontamination of a patient is done, the material removed results in contamination of another area. If a patient is brushed or washed off, all the material removed must be collected and removed from the medical facility. Even though the quantities of radioactive material on one patient may be small, the uncontrolled re-

moval of contamination from large numbers of patients could result in hazardous accumulations of materials in hospital facilities. Problems can arise as a result of trying to decontaminate seriously injured patients who require extensive resuscitative and surgical treatment without delay. It may be necessary to accept a certain amount of contamination in the treatment facilities, during the care of such patients. At intervals when possible, thorough cleaning of the areas will have to be done.

h. It is desirable for those handling patients before or during their decontamination to wear gloves. Any gloves will help, but rubber gloves are preferable. Monitors should supervise disposition of contaminated clothing and equipment, and all staff personnel must emphasize normal hygiene, such as washing hands and face.

i. Whenever a contaminated patient is admitted to the facility prior to complete decontamination, his records should be clearly marked to indicate that he is contaminated. Any suitable code word may be used, such as "RADCON," so long as personnel who come in contact with the patient understand its meaning. After incompletely decontaminated patients have been admitted, monitors should make followup rounds of clinics and wards. When the decontamination of the patient has been completed within the facility, and the monitor verifies this, the monitor should line out the code word and enter the word "clear" along with the date and his initials on the medical record. The patient need receive no special treatment or handling thereafter for reasons of radiological contamination.

j. The receipt of contaminated patients by a medical facility need not require the declaration of any alert or special "condition" throughout the facility. Only the few people who come in direct contact with the patient prior to decontamination need be concerned. Monitors who detect the contamination should notify those in the admission area and those in the supply section who may handle contaminated clothing and equipment. Others in the facility who come in contact with the patient prior to completion of decontamination will be alerted to the extent necessary by the coded entry on the patient's attached record. These are the only members of the staff who need be concerned about the situation (app B).