

Course Title: Radiological Control Technician
Module Title: Radiological Considerations for First Aid
Module Number: 2.15

Objectives:

- 2.15.01 List the proper steps for the treatment of minor injuries occurring in various radiological areas.
- 2.15.02 List the requirements for responding to major injuries or illnesses in radiological areas.
- 2.15.03 State the RCT's responsibility at the scene of a major injury in a radiological area after medical personnel have arrived at the scene.
- ☞ 2.15.04 List the requirements for treatment and transport of contaminated injured personnel at your facility.

INTRODUCTION

"Standard first aid is applied prior to contamination control whenever it is considered to have life-saving value, or is important to the patient for relief of pain or prevention of disability. It is the obligation of all who assist a patient to render such aid within the limits of their training and qualifications."

References:

1. "Basic Radiation Protection Technology" (2nd edition) - Daniel A. Gollnick
2. "Operational Health Physics Training" - H. J. Moe
3. "Injury or Serious Illness in Regulated or Radiation Zones"; Special Hazards Bulletin 4
4. "Handling Regulated Area and Radiation Zone Injuries"; DPSOL 193 -201

2.15.01 List the proper steps for the treatment of minor injuries occurring in various radiological areas.

MINOR INJURIES OCCURRING IN RADIOLOGICAL AREAS

Render first aid as needed.

Survey for contamination. The survey should include clothing, exposed skin, and any wounds. RCTs are responsible for determining whether wounds are contaminated, and to then advise Medical.

Decontamination is then performed as necessary. Decontamination of wounds or broken skin by RCT's is generally limited to flushing with tepid water. Complete decontamination of wounds or broken skin is generally done by Medical personnel.

Inform Medical of the facts regarding injured's name and condition, location, and degree of contamination so that appropriate treatment may be administered.

Get to Medical Aid. If the injury is minor and the person is not contaminated, someone should escort the person to the nearest First Aid Station for treatment. If the injury is minor and the person is contaminated, the affected area should be covered, and they should be taken to the nearest personnel decon room or emergency decon station, and medical assistance should be requested at that location. Depending on the minor injury and local procedures, activation of an emergency response may be appropriate which would provide medical aid.

2.15.02 List the requirements for responding to major injuries or illnesses in radiological areas.

MAJOR INJURIES OCCURRING IN RADIOLOGICAL AREAS

If first to arrive on the scene, administer first aid to the injured. (As always, first aid should be administered only to the extent that an individual is trained and qualified to perform.) The first consideration **IS NOT** moving the injured person from the radiological area. This should be considered prior to first aid measures **only** if leaving the person in the area for a short time would further endanger the injured's and the rescuer's health and safety.

Contamination levels would rarely be the cause for immediately evacuating, or delaying first aid to, a seriously injured person from an area **prior** to first aid.

- A contaminated live person is, in every case, preferable to a clean deceased person.
- If the person administering first aid becomes contaminated, remember that the rescuer can be decontaminated much easier than the injured person can be brought back to life if first aid was delayed to enable the rescuer to avoid becoming contaminated.

Airborne radioactivity would rarely be the cause for immediately evacuating, or delaying first aid to, a seriously injured person from an area **prior** to first aid.

- Remember that a live patient with some internal contamination is always preferable to a deceased person with no internal contamination.

Radiation levels **could** require evacuation to be the first consideration. Consideration must be given to both the injured and the rescuer(s) in this instance. If treating the person in the location would expose them or the rescuer(s) to a hazardous radiation dose, movement out of the area would then be done first.

- This is a judgement call, depending upon the nature of the injuries, the radiological conditions, the location of the injured, etc. There is no "magic number" for a dose rate that would require immediate movement regardless of injury.

Get help to the scene. The timing and method of doing this will depend on the extent of the injuries, the location, how many people are present, etc.

Survey the injured person(s). This should include the clothing, exposed skin, and any wounds. If the injured is in an area with high radiation levels, the RCT must be able to provide an estimated dose equivalent to Medical. Even if the levels are not high enough to warrant immediate evacuation, the total dose to the injured individual may dictate what medical treatment is given. This would require a knowledge of the radiation dose rates in the area, and determination (or estimate) of the length of time that the person was exposed to these levels.

Assist Medical personnel with treatment, transportation, and decontamination. For a seriously injured and contaminated person, transportation would be by ambulance. For transport of contaminated person(s), the RCT would accompany the injured in the ambulance. Necessary measures should be taken to reduce or eliminate the spread of contamination on the way. If the patient has gross transferable contamination, consideration should be given to wrapping the injured person in a blanket to contain the contamination. Since this could prevent or delay treatment, or in some cases aggravate the injuries, it would only be done with the concurrence of Medical personnel.

Control movement of personnel between rooms at the medical facility specific to prevent the spread of contamination.

Provide containers and instruct patients regarding the collection of bioassay samples. Collect specimens of any blood, excised tissue, etc.

Survey all clothing, equipment and instruments used in the medical facility and transport vehicle. Recommend decontamination or disposal of items as necessary. Some typical problems and concerns arise in hospital situations. Portable X-ray machines, used extensively in emergency room settings, cause a problem if being brought into a room with a contaminated patient. As soon as the X-ray has been taken, the hospital staff will usually want to remove the machine from the room ASAP. Waste materials, contaminated materials, radioactive materials or particles, etc. removed from the patient may begin to pose a radiation hazard of their own if allowed to concentrate or remain in the immediate vicinity of the patient and treatment personnel. Accumulating radioactive material in the treatment area can also cause problems with monitoring for dose rates and contamination levels because of the increased background in the area.

2.15.03 State the RCT's responsibility at the scene of a major injury in a radiological area after medical personnel have arrived at the scene.

INTERFACE OF RCT AND MEDICAL PERSONNEL

After the initial response and first aid, the primary duty of the RCT will be with radiological concerns, the primary concern of Medical personnel will be the patients' medical condition and treatment. These two concerns must be balanced against one another keeping the best interest of the patient in mind.

The RCT must be careful **not** to make medical decisions or judgements that he/she is not qualified to make. However, the RCT **will** be primarily responsible for decisions involving radiological concerns.

The RCT should advise medical personnel of radiological conditions and precautions and make decisions concerning the radiological protection of the personnel on the scene.

2.15.04 *List the requirements for treatment and transport of contaminated injured personnel at your facility.*

REQUIREMENTS FOR THE TREATMENT AND TRANSPORT OF CONTAMINATED INJURED PERSONNEL

(Insert site specific material here.)

The following is typical of good Health Physics practices.

If the RCT is the first on the scene and there are injured contaminated personnel, the injuries always take precedence over contamination control. The RCT should only administer first aid that they are trained to perform. The RCT should get help as quickly as possible.

When help arrives, the RCT should assist medical personnel. If the contaminated individual has to be transported to the plant hospital, an RCT usually accompanies the injured person to the area. Prior to transporting, preliminary cleanup of transferable contaminants are to be done to the extent that the patient's injuries permit. If it is not possible to do a preliminary cleanup, wrap the patient in a sheet or blanket to limit the spread of contamination.

Sometimes the injury may need a more extensive evaluation and the individual may have to be transported to an area hospital. The individual should have been stabilized and if possible, contaminated clothing removed and skin decontaminated prior to transporting. If this is not possible the RCT, or other Health Physics representative, usually accompanies the individual to the hospital.

After the needs of the contaminated/injured person have been met, all areas and items that they came in contact with will have to be surveyed for contamination. Other RCT's are typically needed to assist in these situations.

The RCT is responsible for documenting all pertinent information about the incident and results of the surveys taken. The medical staff may be able to survey for contamination, but the RCT still needs to survey and complete the documentation. The RCT should make sure all documentation is thorough and accurate for legal reasons.

SUMMARY

It is imperative that the RCT be prepared to respond in the case of injuries or illnesses occurring in radiological areas. In cases of minor injuries, the primary concern will normally be the removal of contamination and preventing the spread of it. However, in the event of major injuries involving large doses of radiation or contamination patients, first aid and life saving measures will normally take precedent, even at the expense of routine contamination control measures.