

DISCLAIMER

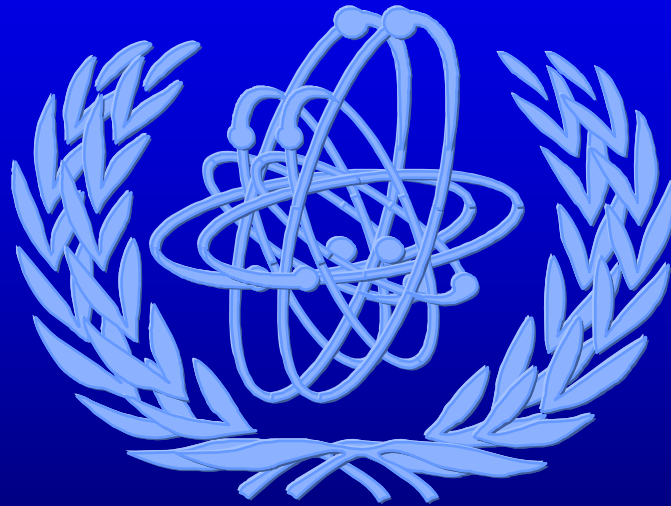
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Emergency Medical Response



On-scene (Pre-hospital Level) Emergency Medical Response

Lecture

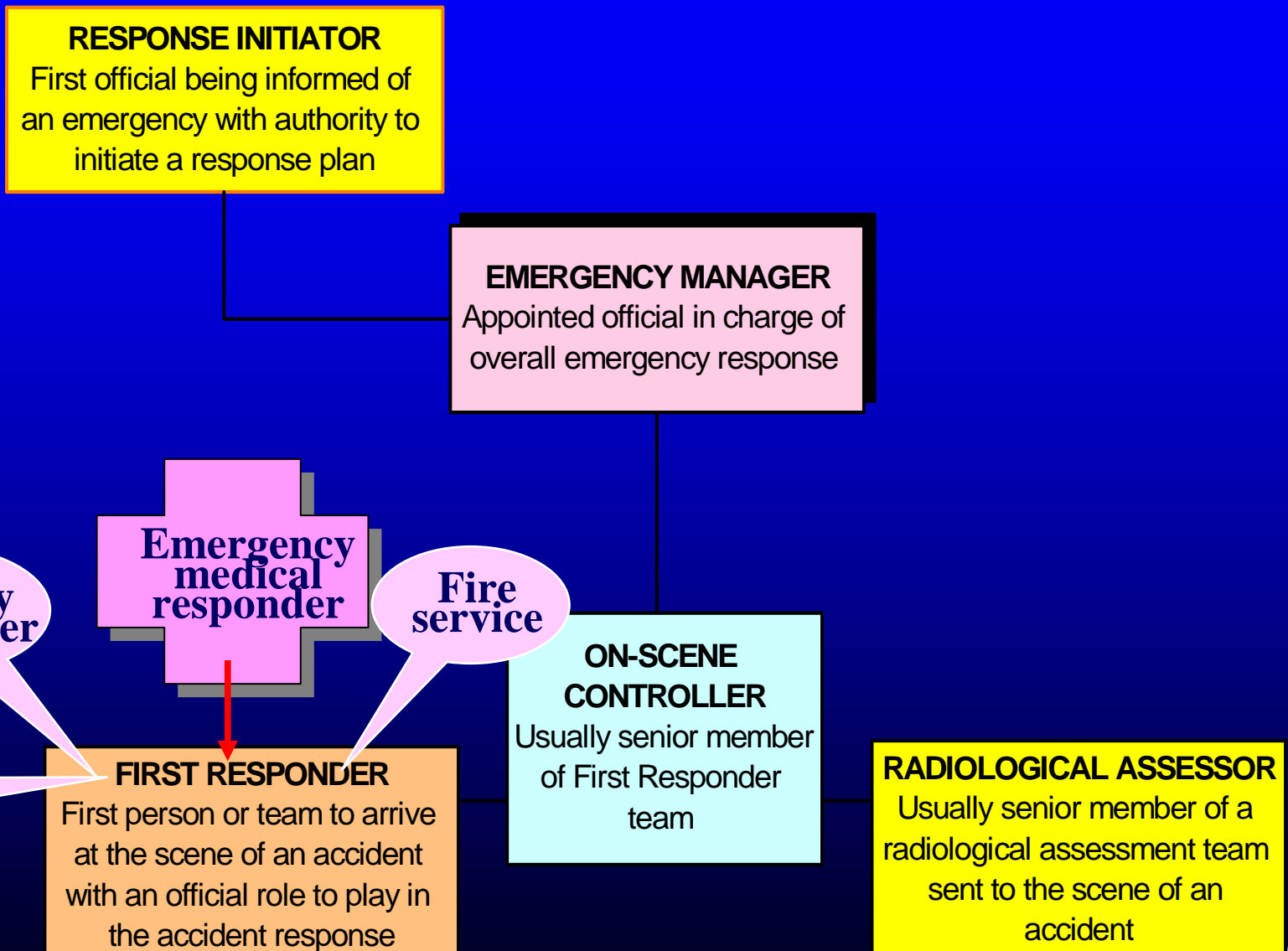
Introduction

- **Basics principles of medical handling of exposed persons can be divided into:**
 - **General methods of handling**
 - **Specific methods due to specificity of the possible health effects of radiation and contamination**
- **Medical handling:**
 - **On-site**
 - **Of-site**

Content

- **Emergency medical response as a part of the overall response organization**
- **Role and tasks of the Emergency Medical Responders on scene**
- **Basic steps for contaminated casualty handling**
- **Basic steps in decontamination**
- **Summary**

Generic Response Organisation



General Rules to On-site Management of Radiation Injuries

- Perform medical triage of injured victims
- Give conventional first aid
- Perform radiological triage of injured victims
- Manage personal contamination
- Manage radiation injuries

Role and Tasks

Accept Your Role, Protect Yourself

- **Implement Procedure C4 (IAEA-TECDOC-1162)**
- **Step 1**
 - **If you are first at the scene assume the role of the On-scene Controller until relieved**
 - **If not, get briefing by the On-scene Controller**
- **Step 2:**
 - **If you have personal dosimeters wear them**
 - **Wear protective clothing as required**

Role and Tasks

Search and Rescue

- **Step 3**
 - **Perform search and rescue for injured persons as soon as possible**
 - **Assess and treat life-threatening injuries immediately**
 - **Perform routine emergency care during extrication procedures**

Role and Tasks

Search and Rescue

- **Step 3 (cont'd)**
 - **Remove injured persons from the hazard area as soon as possible**
 - **If necessary, request additional medical help**

Role and Tasks

Radiological Triage

- **Step 4**
 - **Perform radiological triage and isolate contaminated person(s)**
 - **Remove all contaminated clothing unless medically contraindicated**
 - **Isolate (bag and secure) clothing, shoes, and personal belongings**

Role and Tasks

Radiological Triage

- **Step 4 (cont'd)**
 - **Cover wounds with sterile dressings and prepare injured persons for transport to the hospital**
 - **Transport in a manner suitable to prevent further contamination of the patient, the ambulance, and attending personnel**



Role and Tasks

Establish Contacts

- Step 5

- **Establish contact with the police to obtain names and addresses of the involved population for further interview(s)**

- Step 6

- **Inform the receiving hospital about the nature of the conventional injuries and any known or suspected exposure or contamination with radioactive materials**
- **Identify the radioactive materials if known, if not, request help from Radiological Assessor**



Role and Tasks

Checking contamination

- **Step 7**
 - **Perform personal and equipment contamination check using procedures in IAEA- TECDOC-1092 or request assistance from the Radiological Assessor**
 - **When the medical conditions do not require urgent hospitalisation DO NOT leave the scene of an accident without being checked for possible personal contamination**



Role and Tasks

Checking contamination

- **Step 7 (cont'd)**
 - **DO NOT take any equipment out of the scene area prior to being checked for possible contamination**
 - **If you have to leave the scene urgently then contamination control procedures should be performed as soon as reasonable**

Life Saving and First Aid

Other Response Teams

- **If persons involved in the accident appear to be injured, use standard methods for medical first aid**

**DO NOT DELAY LIFE SAVING ACTIONS
DUE TO THE PRESENCE OF RADIATION!**

- **Remove the injured persons from the hazard area as soon as possible**
- **Notify Emergency Medical Responders and inform them that the victim may be contaminated with radioactive material**



Radioactive Contamination

- **Radioactive contamination – radioactive materials (gases, liquids, solids) released into the environment**
 - **Contamination of environment**
 - **Contamination of objects**
 - **Contamination of people – personal contamination**
- **Personal contamination can be**
 - **External**
 - **Internal**
 - **Combined**

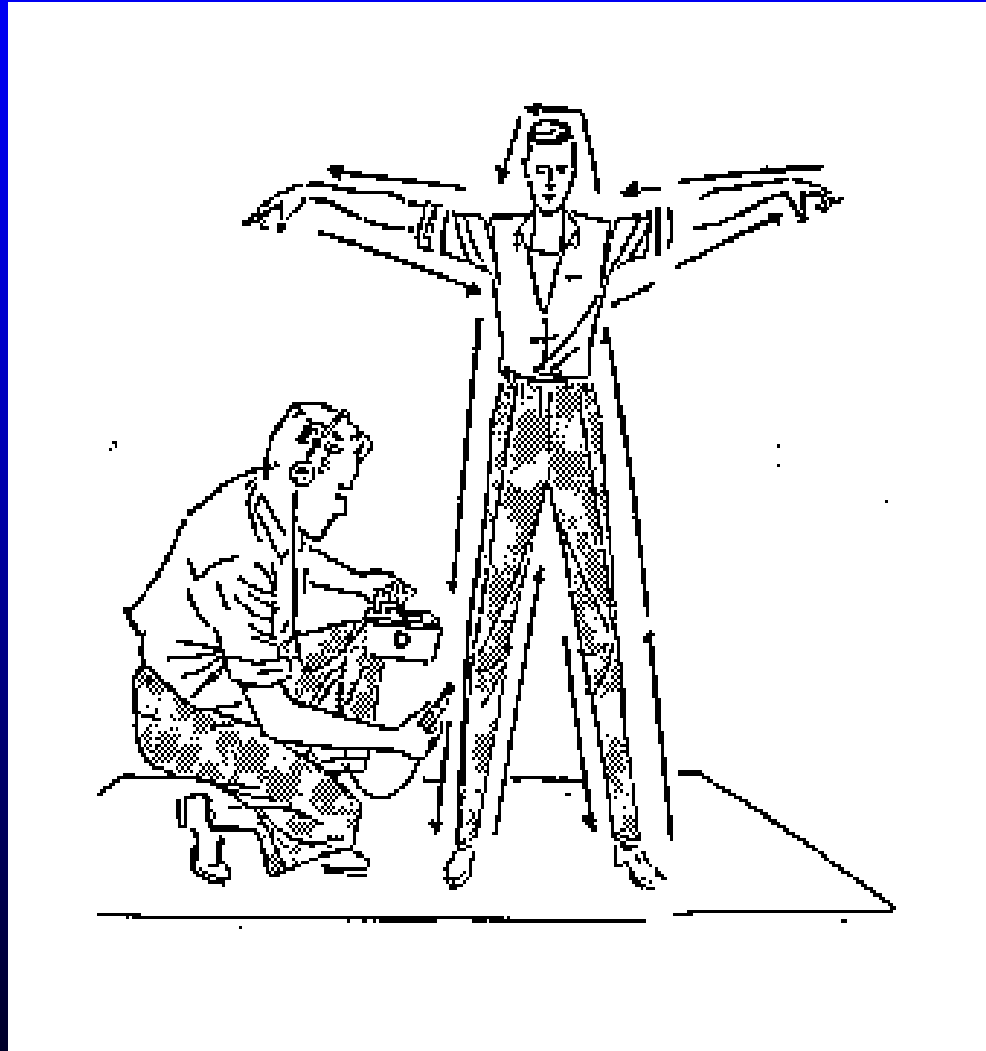


Contamination of the Victims

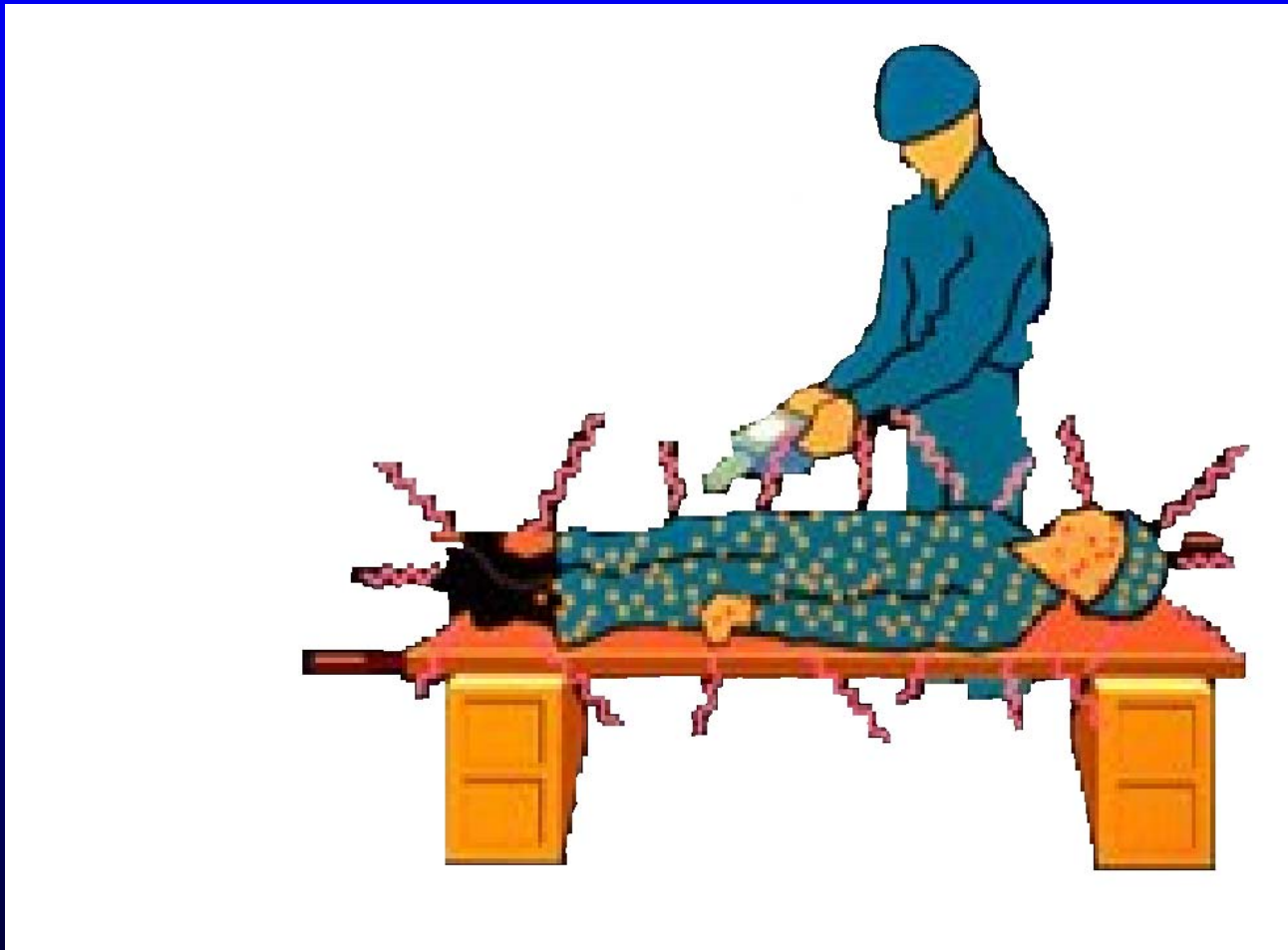
General Consideration

- **Severe external contamination unlikely in the public**
- **Slight contamination may be widespread**
- **Fear of contamination could be widespread even more**
- **Most people are less contaminated than they fear**

Radiological Triage Frisking Technique



Radiological Survey of the Injured Person on the Stretcher



Operational Intervention Levels

Skin and Clothing

Contaminant	OIL [Bq/cm ²]
General beta/gamma emitters Less toxic alpha emitters	4.0
More toxic alpha emitters	0.4

Trying to measure these levels will take several minutes with a typical hand held probe. In case of urgency multiply the levels by a factor of 10 backing this up by instructions to change clothing for known clean kit followed by hand washing and washing of hair



Decontamination Procedures

- **Life saving measures first**
- **Use warm water, soap, or ordinary detergent, soft brush, plastic sheet, tape towel, sheet**
- **Remove entire clothing and place in plastic bag**
- **Identify contaminated areas, mark clearly, and cover until decontamination takes place**
- **Start decontamination from the wound, when present, and move on to the highest contaminated areas**



Medical management Contaminated Victims

- In all cases and at any step of medical aid, the first priority in the care of the patients is to attend to the most severe life-threatening injuries
- Perform decontamination after stabilization
 - **The presence of potential radioactive contamination should not deter the nature or rapidity of medical care**
- All clothing should be removed using contamination control techniques



Routes of Contamination

Skin

- **Skin may become contaminated if in contact with radioactive aerosols, liquids, or contaminated surfaces**
- **Beta-emitting radionuclides are the most hazardous for skin and can cause serious burns of the skin and underlying tissues**



Skin Decontamination

- **Purpose**
 - **To decrease the risk of skin beta burns, to lower the risk of internal contamination of the victim and to reduce the chance of further contamination**
- **General rule**
 - **Decontamination should be done by washing with cleaning solutions but not to the extent that the skin is further damaged or abraded**

Skin Decontamination (1)

- **After the person's clothing is removed, washing the person with detergent and water is 95% percent effective**
- **Keep in mind that the stratum corneum of the epithelium is replaced every 12-15 days. Thus, contamination that is not removed and is not absorbed by the body will be sloughed within a few days**
- **If contamination is not removed by washing, wrap the contaminated area and, over time, sweating will decrease contamination**



Local Contamination

- **Cover uncontaminated area with plastic sheet and tape edges**
- **Soak, gently scrub with soap, and rinse thoroughly**
 - **Repeat the cycle and observe changes in activity**
 - **One cycle should not last longer than about 2-3 min**
 - **Avoid vigorous scrubbing**
 - **A stable isotope solution may facilitate the process**



Summary

- This lecture presented materials about on-scene emergency medical response
- The main points important to note are:
 - **First aid is an important task for Emergency Responders on the scene of the accident**
 - **Tasks of Emergency Medical Responders should be coordinated with tasks of other responders**
 - **Contaminated casualty handling – way to decrease the contamination of victims and to prevent the spread of contamination**
- Comments are welcomed



Where to Get More Information

- **IAEA-TECDOC-1162, *Generic Procedures for assessing and response during a radiological emergency*, IAEA, Vienna, 2000**
- **IAEA-TECDOC-xx, *Generic Procedures for Medical Response during Radiation Emergency*, IAEA, Vienna (2002, in preparation)**

