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Medical Preparedness and Response for a Nuclear or Radiological Emergency

Webinar on Medical Preparedness and Response for a Nuclear or Radiological Emergency

IAEA's IEC - WHO

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Objective

- ✓ To describe overarching requirement 12 of IAEA Safety Standards Series No. GSR Part 7:
  - ✓Managing the medical response in a nuclear or radiological emergency.
- ✓To present the arrangements for effective medical EPR for a nuclear or radiological emergency.
- ✓To raise awareness about the role of healthcare professionals in these emergencies.

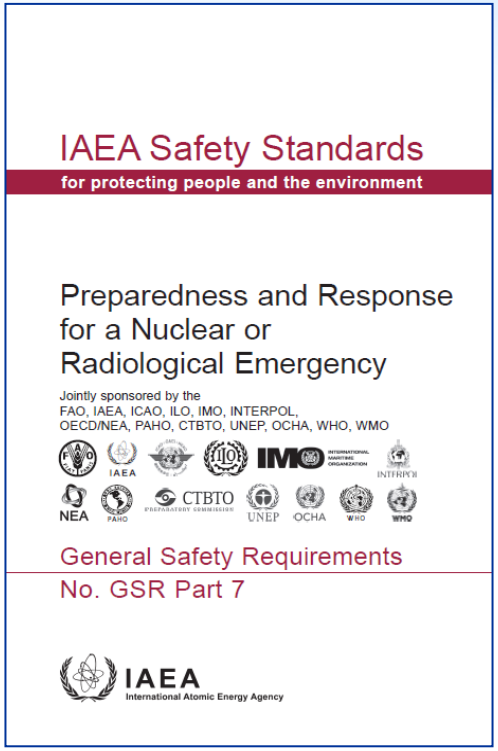
Contents

- ✓Overview of the Requirement 12: Managing the medical response in a nuclear or radiological emergency.
- ✓Considerations for implementation

Introduction

- Requirement 12: Managing the medical response in a nuclear or radiological emergency.

The government shall ensure that arrangements are in place for the provision of appropriate medical screening and triage, medical treatment and longer term medical actions for those people who could be affected in a nuclear or radiological emergency.



Introduction

- Screening and triage
- Treatment
- Long term medical actions

- Healthcare professionals:
  - Medical doctors
  - Nurses
  - Medical physicist
- Preparedness activities:
  - Plan
  - Procedures
  - Guidance protocols
  - Criteria
  - Training courses
  - Training materials
  - Exercises
- Designated medical facilities
  - Reception centres
  - Healthcare centres
  - Hospitals
  - Centres for follow-up
- etc.

People who could be affected

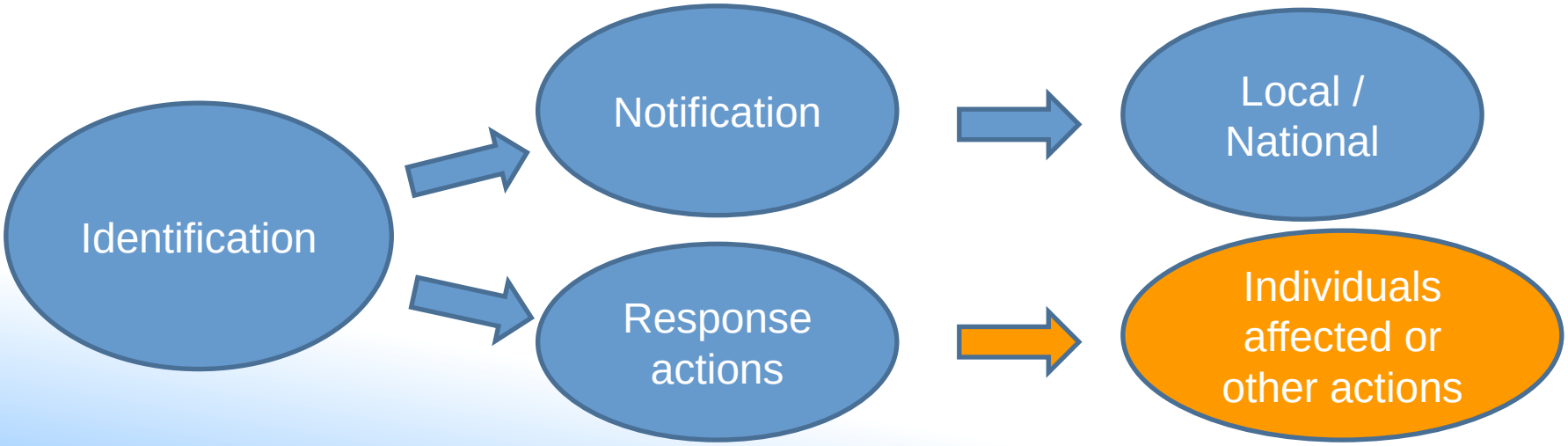
- Individuals / persons exposed
- Patients
- Workers
- Helpers
- Members of the public
- “Worried well”
- Considering medical condition, age, pregnancy
- etc.

GSR Part 7: Requirement 12

Para.	Managing the medical response in a nuclear or radiological emergency
5.62	Identification, notification and response
5.63	Diagnosis
5.64	Life saving actions over decontamination. Medical attention
5.65	Predesignated medical facilities
5.66	Medical screening and triage
5.67	Medical management and follow-up, including: a) Guidance for diagnosis and treatment b) Designated personnel c) Evaluation of radiation exposure in designated institutions Arrangements for consultation with experts
5.68	Long term medical actions

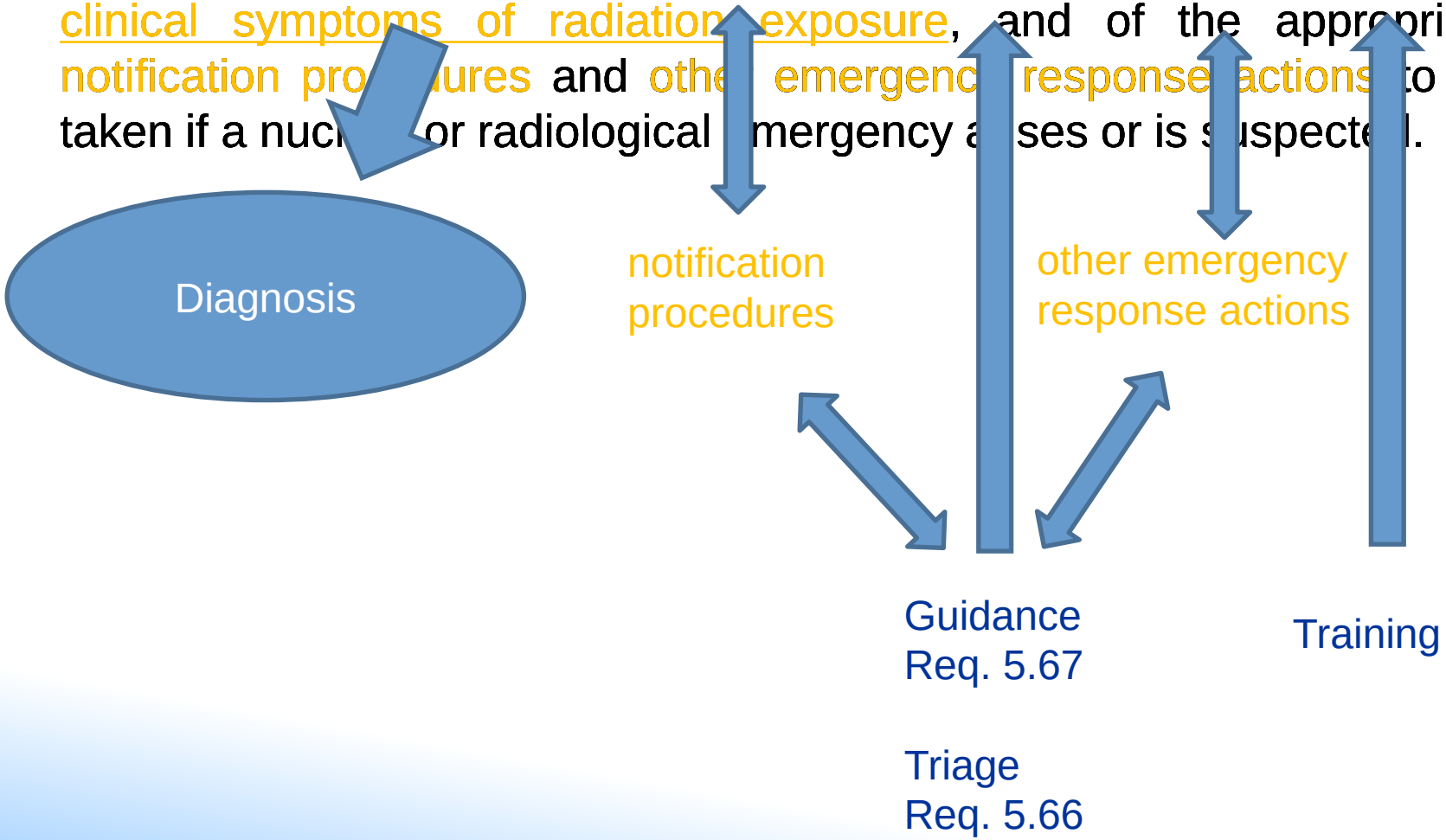
Identification, notification and response

- 5.62. On the presentation by an individual of clinical symptoms of radiation exposure or other indications associated with a possible nuclear or radiological emergency, the medical personnel or other responsible parties who identify the clinical symptoms or other indications shall notify the appropriate local or national officials and shall take response actions as appropriate.



Diagnosis

- 5.63. Arrangements shall be made for medical personnel, both general practitioners and emergency medical staff, to be made aware of the clinical symptoms of radiation exposure, and of the appropriate notification procedures and other emergency response actions to be taken if a nuclear or radiological emergency arises or is suspected.



Appropriate medical attention

- 5.64. Arrang[illegible] shall be made so that, in a nuclear or radiological emergen[illegible]with possible contamination can promptly be given ap[illegible] att[illegible] arrangements shall include ensuring t[illegible] se[illegible]ded where needed and providing instructions[32] to [illegible]el on the precautions to take.

Treatment

Transport

Life saving actions are priority over decontamination actions

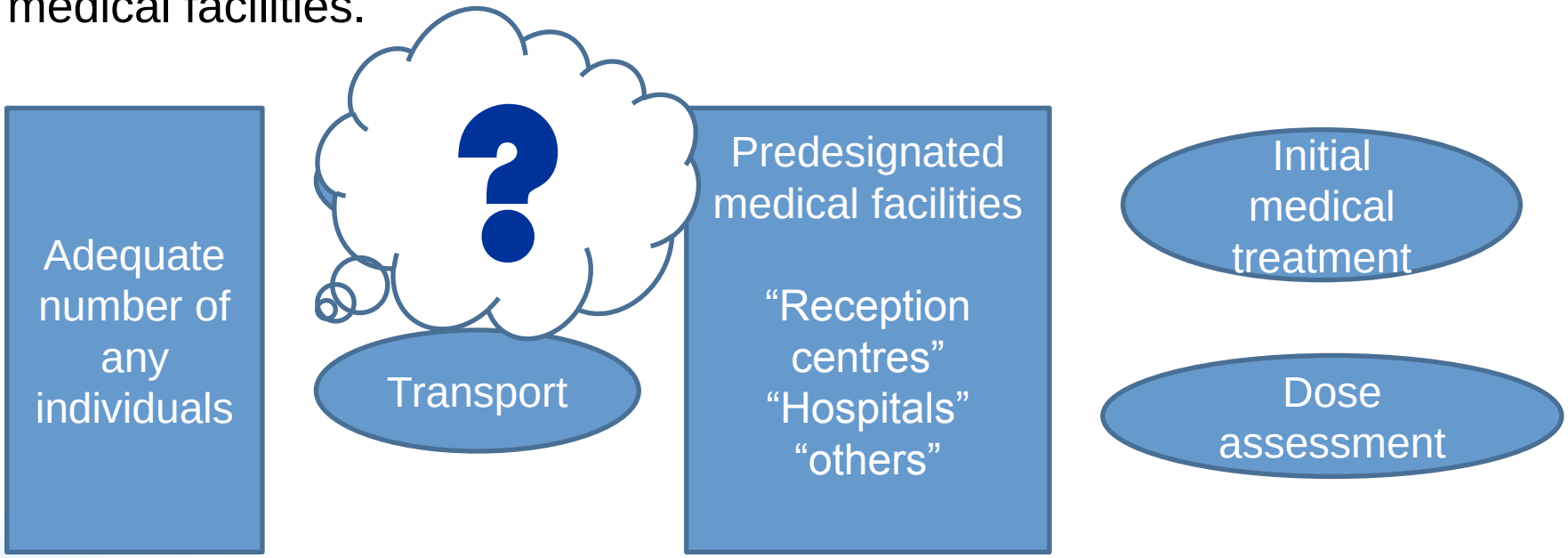
Instructions to medical personnel (Lesson identified in several accidents)

Image courtesy [illegible]

[32] These instructions include advice that universal precautions in health care against infection (e.g. surgical masks and gloves) generally provide medical personnel with adequate protection when treating individuals with possible contamination.

Predesignated medical facilities

- 5.65. For facilities in categories I, II and III, arrangements shall be made to manage an adequate number of any individuals with contamination or of any individuals who have been overexposed to radiation, including arrangements for first aid, the estimation of doses, medical transport and initial medical treatment in predesignated medical facilities.



Pre-designated medical facilities

Adequate number of any individuals

Predesignated medical facilities

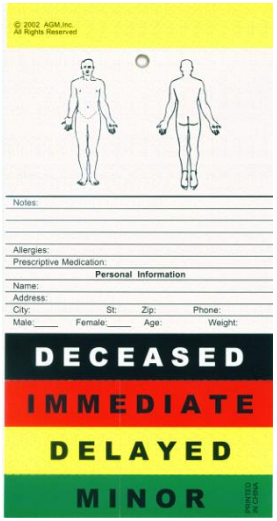
Images courtesy NIRS)

Images courtesy REACTS/Oak Ridge Associated Universities (ORAU)

Medical screening and triage

- 5.66. For areas within emergency planning zones (see para. 5.38), arrangements shall be made for **performing medical screening and triage** and for assigning to a predesignated medical facility any individual exposed at levels exceeding the criteria in Table II.1 of Appendix II. These arrangements shall include the use of pre-established operational criteria in accordance with the protection strategy (see para. 4.28(4)).

Images courtesy IAEA



Triage (The START method)

Medical screening and triage

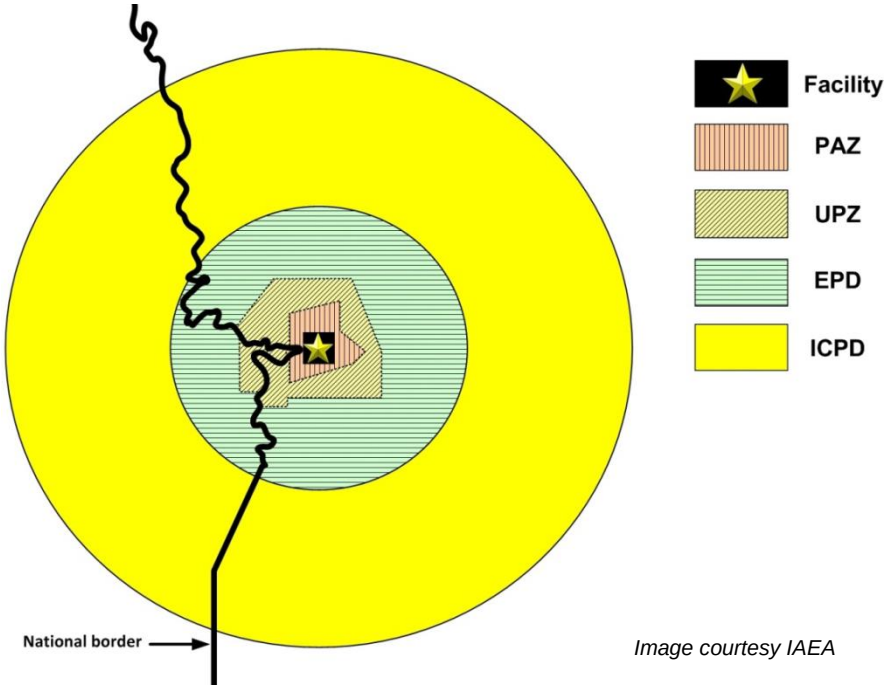


Image courtesy IAEA

Precautionary action zone (PAZ);
Urgent protective action planning zone (UPZ);
Extended planning distance (EPD);
Ingestions and commodities planning distance (ICPD).

TABLE II.1. GENERIC CRITERIA FOR DOSES RECEIVED WITHIN A SHORT PERIOD OF TIME FOR WHICH PROTECTIVE ACTIONS AND OTHER RESPONSE ACTIONS ARE EXPECTED TO BE TAKEN UNDER ANY CIRCUMSTANCES IN AN EMERGENCY TO AVOID OR TO MINIMIZE SEVERE DETERMINISTIC EFFECTS

Acute external exposure (<10 h)		
$AD_{\text{red marrow}}$ [a]	1 Gy	If the dose is projected: — Take precautionary urgent protective actions immediately (even under difficult conditions) to keep doses below the generic criteria; — Provide public information and warnings; — Carry out urgent decontamination.
AD_{fetus}	0.1 [b] Gy	
AD_{tissue} [c]	25 Gy at 0.5 cm	
AD_{skin} [d]	10 Gy to 100 cm^2	
Acute internal exposure due to an acute intake ($\Delta = 30$ d [e])		
$AD(\Delta)_{\text{red marrow}}$	0.2 Gy for radionuclides with atomic number $Z \geq 90$ [f] 2 Gy for radionuclides with atomic number $Z \leq 89$ [f]	If the dose has been received: — Perform immediate medical examination, medical consultation and indicated medical treatment; — Carry out contamination control; — Carry out immediate decorporation [g] (if applicable); — Conduct registration for longer term medical follow-up; — Provide comprehensive psychological counselling.
$AD(\Delta)_{\text{thyroid}}$	2 Gy	
$AD(\Delta)_{\text{lung}}$ [h]	30 Gy	
$AD(\Delta)_{\text{colon}}$	20 Gy	
$AD(\Delta')_{\text{fetus}}$ [i]	0.1 [b] Gy	

[a] $AD_{\text{red marrow}}$ represents the average RBE weighted absorbed dose to internal tissues or organs (e.g. red marrow, lung, small intestine, gonads, thyroid) and to the lens of the eye from exposure in a uniform field of strongly penetrating radiation.

Medical management

- 5.67. Arrangements shall be made to **identify individuals** with possible contamination and individuals who have possibly been sufficiently exposed for radiation induced health effects to result, and to **provide them with appropriate medical attention**, including longer term **medical follow-up**. These arrangements shall include:

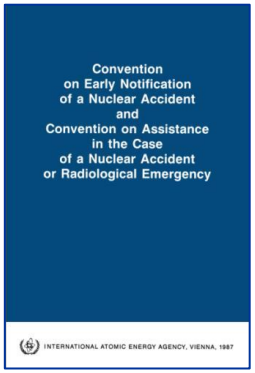
(a) Guidelines for effective diagnosis and treatment;

(b) Designation of medical personnel trained in clinical management of radiation injuries;

(c) Designation of institutions for evaluating radiation exposure (external and internal), for providing specialized medical treatment and for longer term medical actions.

Medical management

- These arrangements shall also include the use of pre-established operational criteria in accordance with the protection strategy (see para. 4.28(4)) and arrangements for medical consultation on treatment following any exposure that could result in severe deterministic effects (see Appendix II) with medical personnel experienced in dealing with such injuries.[33]



[33] Such arrangements for medical consultation on treatment could include **international assistance** to be provided through or to be coordinated by the IAEA and by WHO; for example, **under the Assistance Convention**

Long term medical actions

- 5.68. Arrangements shall be made for the identification of individuals who are in those population groups that are at risk of sustaining increases in the incidence of cancers as a result of radiation exposure in a nuclear or radiological emergency. Arrangements shall be made to take **longer term medical actions to detect radiation induced health effects** among such population groups in time to allow for their effective treatment. These arrangements shall include the use of pre-established operational criteria in accordance with the protection strategy (see para. 4.28(4)).

Considerations for implementation of Requirement 12

- For the implementation of the Requirements 12 at the national level, several aspects should be considered:
  - ✓ Authorities involvement and their responsibilities
  - ✓ Establishment/designation of necessary infrastructure (e.g. designation of hospitals, reception centres, laboratories and others institutions)
  - ✓ Establishment and maintenance of adequate guidance, protocols, plan and procedures at various levels (not only at the national level but at local and facility levels)
  - ✓ Human resources needed, their qualifications and skills
  - ✓ Necessity for regular training and exercises at different levels
  - ✓ Need for coordination and exchange of information with other response organizations
  - ✓ Need to function within the same emergency management structure with others involved in the response

Considerations for implementation of Requirement 12 (cont.)

- Take account of:
  - The overall protection strategy and your role to implement it safely and efficiently
    - Identify those healthcare professionals and medical staff who perform relevant work in an emergency response and designate them as emergency workers
    - Identify appropriate dose restrictions to be applied for them, train them on their expected duties, provide information on risks associated and provide for their protection and dose monitoring
  - Limitations at national level and expertise for which international assistance might be needed
  - Previous experiences and analysis of past emergencies could also provide important information

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Thank you!