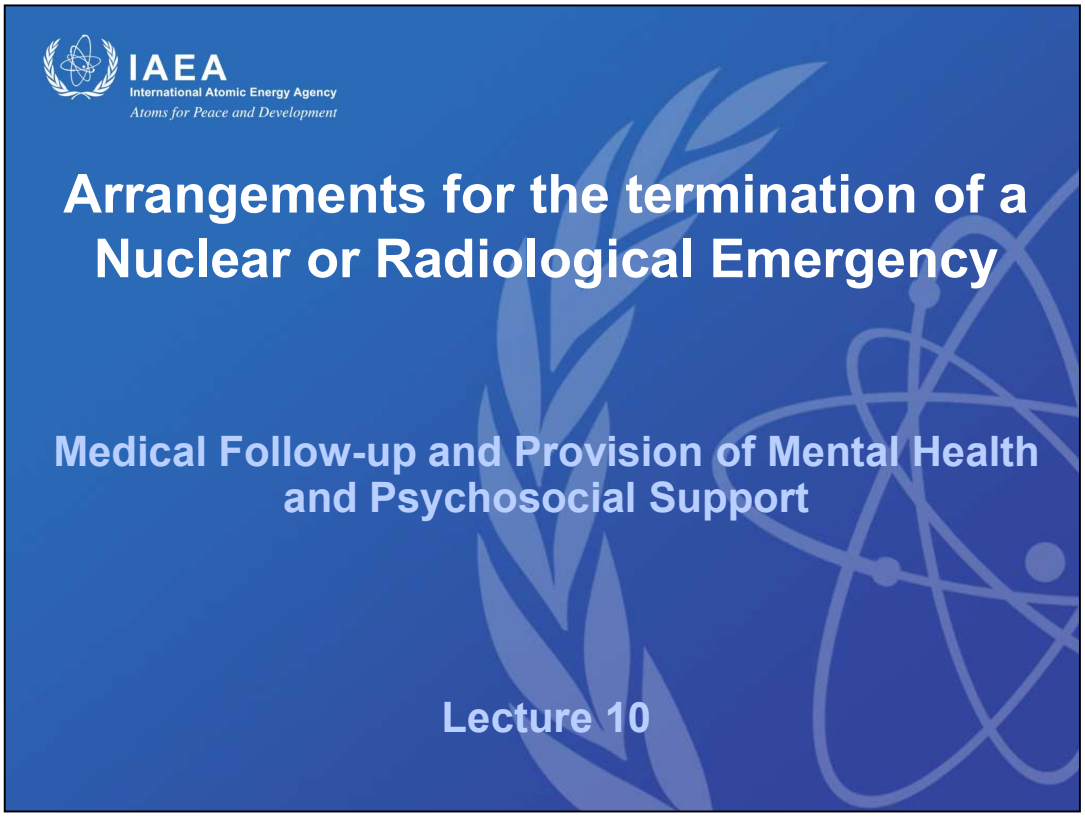
Arrangements for the Termination of a Nuclear or Radiological Emergency



Lecture:10. Medical Follow-up and Provision of Mental Health and Psychosocial Support.

Purpose of the Presentation:

- Help identifying emergency arrangements to be made for the medical follow-up, mental health and psychosocial support following a nuclear or radiological emergency
- Help identifying how these arrangements fit within the overall response efforts during the transition phase
- Share relevant experience from past emergencies

Learning objectives:

- Identify activities to be carried out during the transition phase to allow the medical follow-up and for provision of mental health and psychosocial support
- Recognize arrangements to be made for achieving effectively the prerequisites for terminating the emergency related to medical follow-up, mental health and psychosocial support
- Identify challenges faced and relevant lessons learned from past emergencies

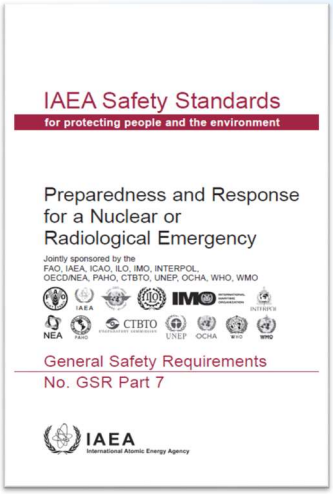
Duration: 60 minutes

References:

1. International Atomic Energy Agency, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).
2. International Atomic Energy Agency, Arrangements for the Termination of a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSG-11, IAEA, Vienna (2018).
3. International Atomic Energy Agency, Arrangements for Preparedness for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GS-G-2.1, IAEA, Vienna (2007).
4. International Atomic Energy Agency, Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSG-2, IAEA, Vienna (2011).
5. International Atomic Energy Agency, Generic Procedures for Medical Response during a Nuclear or Radiological Emergency, EPR-Medical 2005, IAEA, Vienna (2005).
6. International Atomic Energy Agency, Cytogenetic Dosimetry: Applications in Preparation for and Response to Radiological Emergency, EPR-Biodosimetry 2011, IAEA, Vienna (2011).

Introduction.
GSR Part 7, Requirement 12

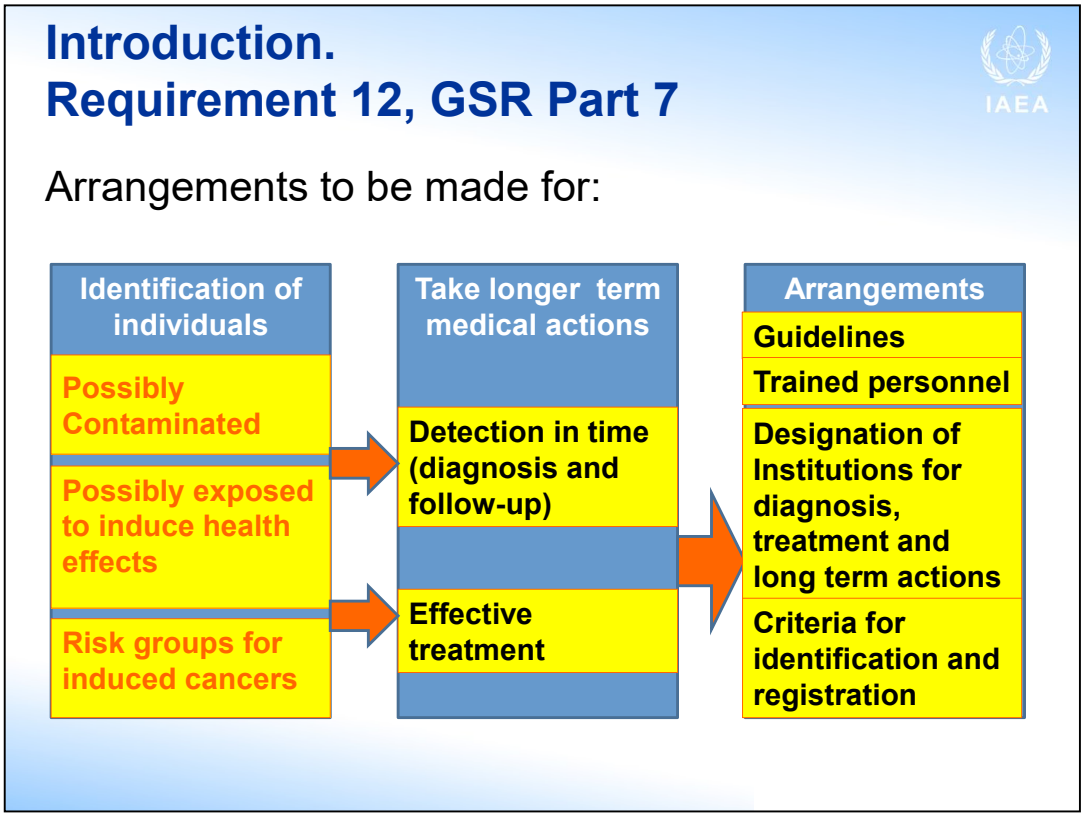
"The government shall ensure that arrangements are in place for the provision of appropriate medical screening and triage, medical treatment and longer term medical actions for those people who could be affected in a nuclear or radiological emergency."



Lecture notes:

Reference:

1. International Atomic Energy Agency, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).



Lecture notes:

GSR Part 7, Requirement 12 states:

- "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:
    - Guidelines for effective diagnosis and treatment;
    - Designation of medical personnel trained in clinical management of radiation injuries;
    - Designation of institutions for evaluating radiation exposure (external and internal), for providing specialized medical treatment and for longer term medical actions.

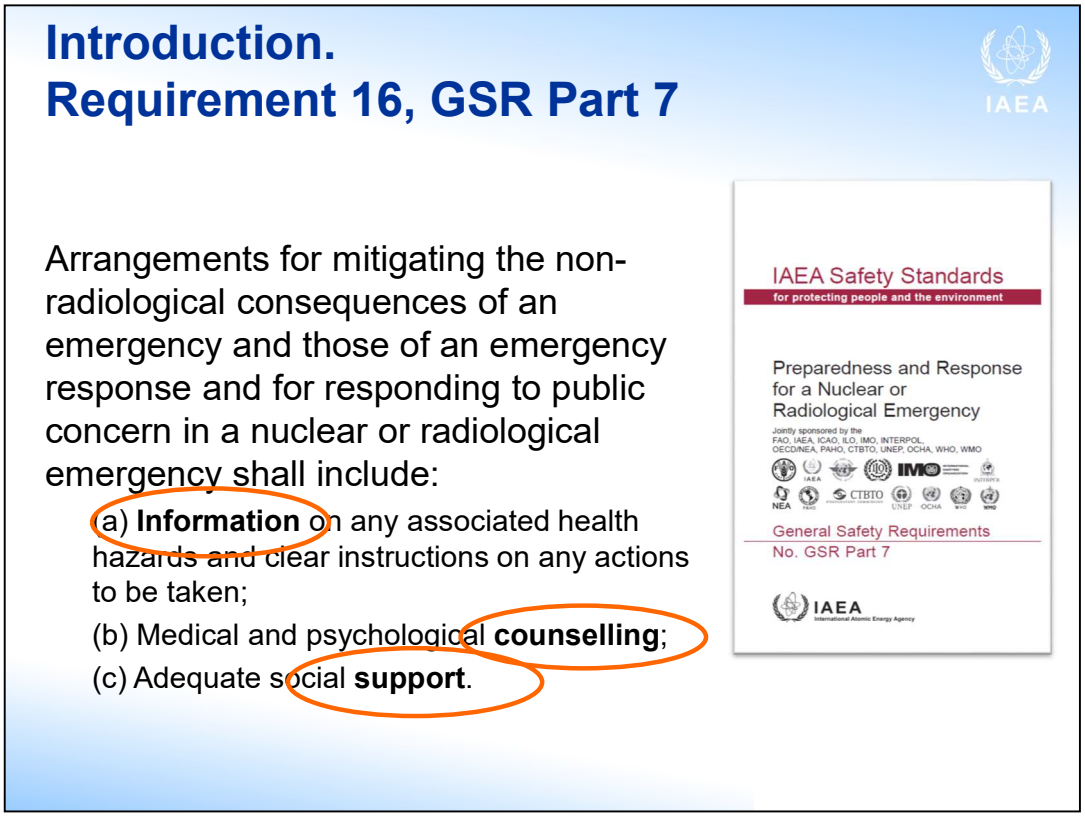
Lecture notes:

These arrangements shall also include the use of pre-established operational criteria in accordance with the protection strategy and arrangements for medical consultation on treatment following any exposure that could result in severe deterministic effects with medical personnel experienced in dealing with such injuries."

- "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."
- "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. Arrangement 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."

Reference:

1. International Atomic Energy Agency, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).



Lecture notes:

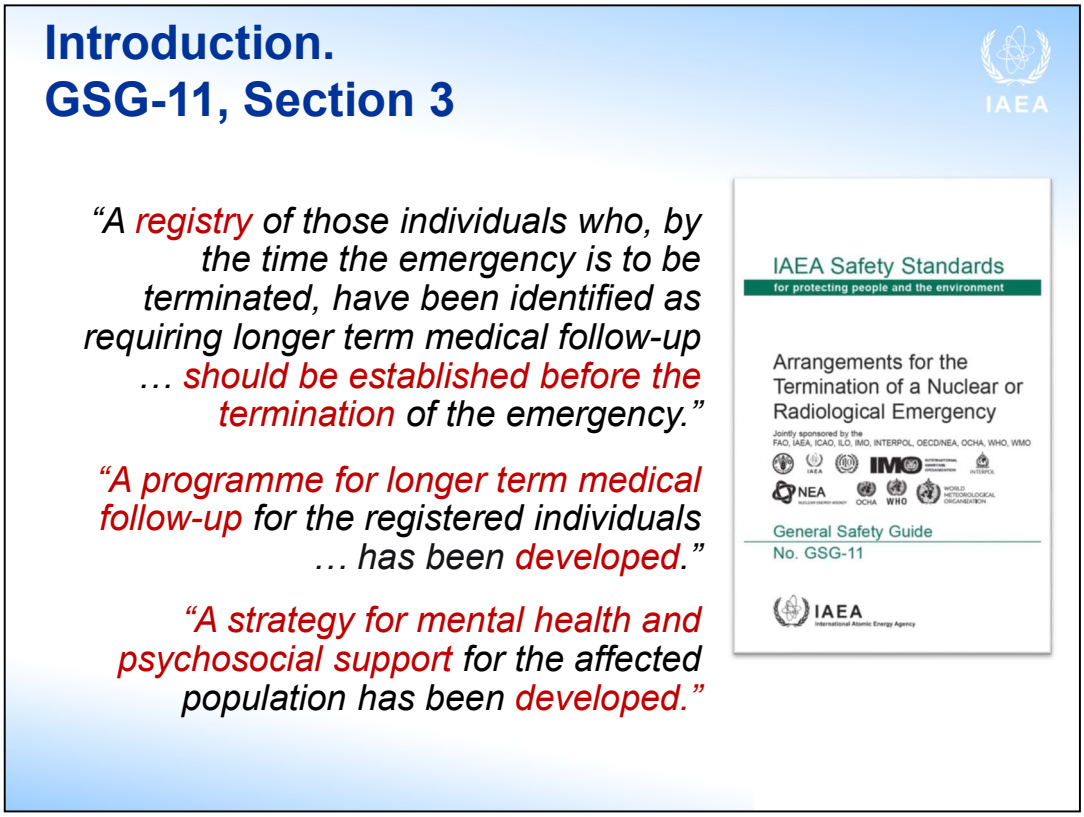
GSR Part 7, Requirement 16: Mitigating non-radiological consequences of a nuclear or radiological emergency and of an emergency response:

"Arrangements shall be made for mitigating the non-radiological consequences of an emergency and those of an emergency response and for responding to public concern in a nuclear or radiological emergency. These arrangements shall include arrangements for providing the people affected with:

- Information on any associated health hazards and clear instructions on any actions to be taken (see Requirement 10 and Requirement 13);
- Medical and psychological counselling, as appropriate;
- Adequate social support, as appropriate."

Reference:

1. International Atomic Energy Agency, Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7, IAEA, Vienna (2015).



Lecture notes:

Section 3, GSG-11:

General Prerequisites:

- A registry of those individuals who, by the time the emergency is to be terminated, have been identified as requiring longer term medical follow-up should be established before the termination of the emergency.

Specific prerequisites:

- A programme for longer term medical follow-up for the registered individuals has been developed.
- A strategy for mental health and psychosocial support for the affected population has been developed.

References:

1. International Atomic Energy Agency, Arrangements for the Termination of a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSG-11, IAEA, Vienna (2018).

Purpose

- Help identifying emergency arrangements to be made for
  - Medical follow-up and
  - Mental health and psychosocial support

following a nuclear or radiological emergency

- Help identify how these arrangements fit within overall response efforts during the transition phase
- Share relevant experience from past emergencies

Learning Objectives

- Identify activities to be carried out during the transition phase to allow for the medical follow-up and the provision of mental health and psychosocial support.
- Recognize arrangements to be made for achieving effectively prerequisites for terminating the emergency related to medical follow-up, mental health and psychosocial support.
- Identify challenges faced and relevant lessons learned from past emergencies.

Contents

- Needs
- Medical follow-up
  - Objectives and criteria
  - Coordination
  - Registration
  - Information sharing
  - Arrangements at preparedness stage
- Mental health and psychosocial support
  - Objectives
  - Arrangements under an all-hazards approach
  - Public support centres

Discussion

Who may need medical follow-up and psychosocial support in the aftermath of a nuclear or radiological emergency, and why?

Lecture notes:

Allow for about 3 mins. of discussion.

Lecture notes:

A severe radiological accident occurred in Peru (2012), involving 3 workers from an industrial radiography company, working with a high activity source of Iridium-192.

The worker whose hands are shown in the pictures did not followed the safety procedures and presented severe local radiation injuries being treated in France the year of the accident and the following year in Chile (supported by French experts) due to severe recurrences.

The pictures show the evolution of the case, from left to right:

- Left: Peru, the facilities for the industrial radiography and the initial photo taken of the hands of the patient with an estimation of doses.
- Centre: photo of the left hand of the patient after he received initial treatment in France in the year of the accident.
- Right: The hand of the patient after a year of exposure, which a recurrence of the local radiation injuries can be seen (upper photo). The hands of the patient after the second treatment performed in Chile are shown in the lower photo.

Lecture notes:

In both situations, the assistance was provided under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, coordinated by the Incident and Emergency Centre of the IAEA.

This is an experience that shows the importance of the medical follow-up for individuals with severe overexposures.

FIG.1.:Courtesy of International Atomic Energy Agency

FIG.2.: Dose measured by electron paramagnetic resonance spectroscopy on fingernails for Worker 1. (Courtesy of the IRSN.), International Atomic Energy Agency, The Radiological Accident in Chilca, IAEA, Vienna (2018)

FIG. 3.: Status/view of the hand of Worker 1 (day 124, 14 May 2012). (Courtesy of the HIA Percy–IRSN.), International Atomic Energy Agency, The Radiological Accident in Chilca, IAEA, Vienna (2018)

FIG. 4.: Worker 1: Hands of the patient on day 383 after the accident — recurrence of local radiation injuries. (Courtesy of A. Lachos, INEN.), International Atomic Energy Agency, The Radiological Accident in Chilca, IAEA, Vienna (2018)

FIG. 5.: Healing on both hands, 604 d after the accident, International Atomic Energy Agency, The Radiological Accident in Chilca,, IAEA, Vienna (2018)

Lecture notes:

The Goiânia accident is still an important reference for the medical follow-up, not only for physicial but also for psychological sequelae.

It has been considered the most severe radiological accident resulting in deaths, and patients still present physical and mental sequelae.

Case 1– Thigh of the individual who put a fragment of the source in the left pocket of his trousers.

- Upper photo from 1987 (courtesy of Brazilian CNEN). He presented radionecrosis that demanded three surgical procedures.
- After 30 years later, this patient still presents physical sequelae, shown in the bottom picture (courtesy of Brazilian CNEN).

Case 2- Foot of the individual who actually entered the abandoned clinic and removed the head of the teletherapy equipment.

- Photo shows severe sequel of local radiation injury of the left foot, which occurred 30 years after the accident (courtesy of Brazilian CNEN).

Lecture notes:

These examples demonstrate the need for medical follow-up even many years after the emergency happened in comparison to the previous example.

FIG. on the left: A radiation induced lesion on the right thigh about 25 days after irradiation, International Atomic energy Agency, The Radiological Accident in Goiânia,, IAEA, Vienna (1988)

FIG. on the right: Image courtesy by : Dr. N. Valverde (Nelson Valverde), International Atomic energy Agency, The Radiological Accident in Goiânia, , IAEA, Vienna (1988)

Increase in incidence of thyroid cancers after the Chernobyl accident

- Chernobyl thyroid cancer increase in Belarus (no increase in other cancers seen).

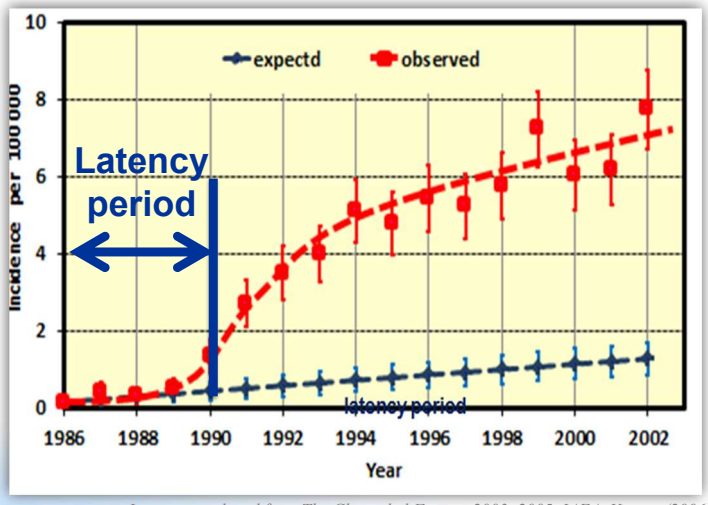


Image reproduced from The Chernobyl Forum: 2003–2005, IAEA, Vienna (2006)

Lecture notes:

Radiation induced cancers are of primary concerns among affected populations and the general public. In the aftermath of the Chernobyl accident, only an increase in thyroid cancer was observed among the young population, after about 4 to 5 years of the accident onset. Since 1990, there has been a large increase in the incidence in thyroid cancer among Belarussian children who were aged between 0-18 years at the time of the accident. Over 6,000 thyroid cancers were diagnosed by 2010.

The graph shows the increase in the incidence of cancers among children in Belarus and Ukraine following the Chernobyl accident. This increase was due to high thyroid doses resulting from drinking milk from cows grazing on grass contaminated with radioactive iodine. This increase was easily observed because of the low background rate of thyroid cancers (< 1%). As can be seen in the figure, the rapid increase in the cancer incidence rate occurred after the latency period of about four to five years following the accident.

These cancers respond favorably to early treatment, and to date, only a few of the children diagnosed in Belarus with thyroid cancer have died as a result of the cancer.

Lecture notes:

This shows the importance of identifying children who may have received high thyroid doses for medical monitoring starting about 2 years after a severe release.

References:

1. International Atomic Energy Agency, Chernobyl's Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine, The Chernobyl Forum: 2003–2005, Second revised version, IAEA, Vienna (2006).

The Fukushima Daiichi accident in 2011

- Traumatic experience associated with evacuation;
- Social stigma.

Photograph courtesy of Koichi Nakamura/AP Images/picturedesk.com

Lecture notes:

A nuclear or radiological emergency may have huge non-radiological consequences that may exceed the radiological ones. These can be related to adverse psychosocial impacts of the emergency and emergency response actions and can be seen in many past emergencies. An example would be the Fukushima Daiichi accident in 2011, with the traumatic experiences of the evacuees and the impact which the social stigma had on them. These are not specific to nuclear or radiological emergencies and are experienced in any conventional emergency and associated evacuation, loss of property and businesses, etc.

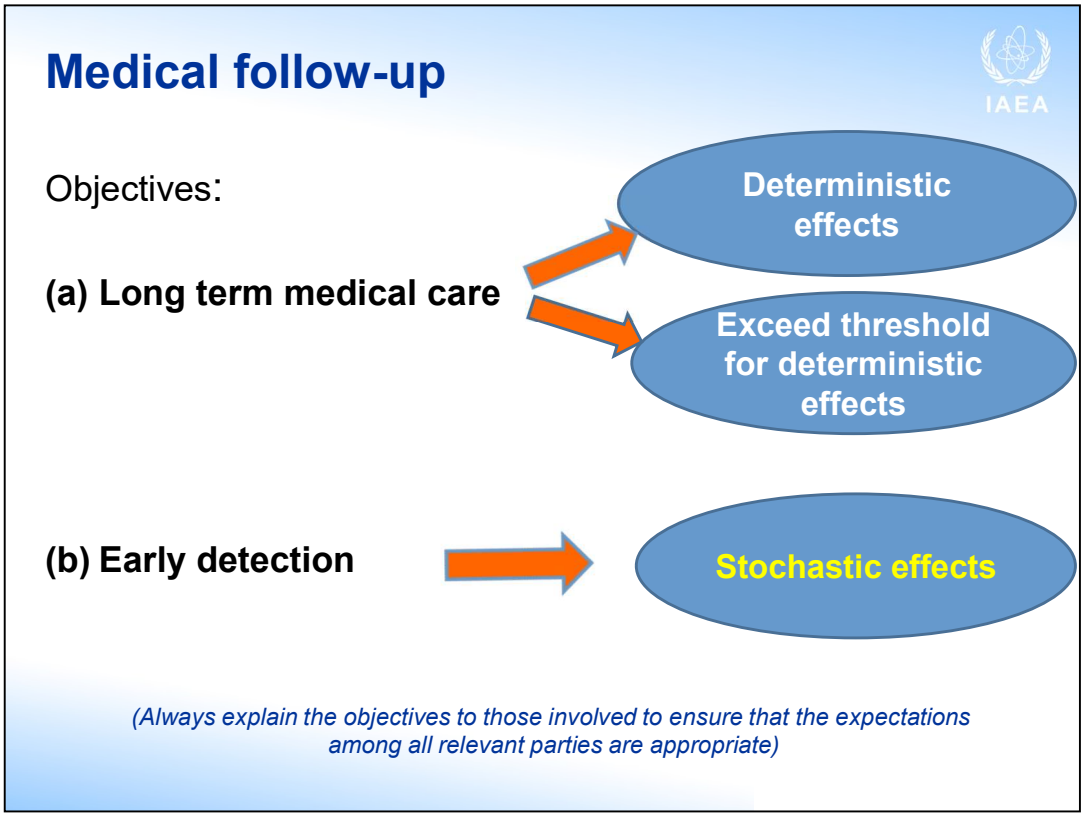
FIG. : The initial evacuation led to crowded conditions in shelters; photograph courtesy of Koichi Nakamura, Intenational Atomic Energy Agency, The Fukushima Daiichi Accident, , IAEA, Vienna (2015)

Medical follow-up and mental health and psychosocial support needs

- Individuals:
  - Overexposed in an emergency;
  - Exposed at levels that entail the risk of sustaining an increase in the incidence of radiation induced cancers;
  - Subjected to disruptive public protective actions, such as evacuation and relocation, or returning to live in the affected area;

Lecture notes:

On the basis of previously presented examples, the slide presents the three groups of individuals that may need longer term medical follow-up, mental health and psychosocial support after a nuclear or radiological emergency.

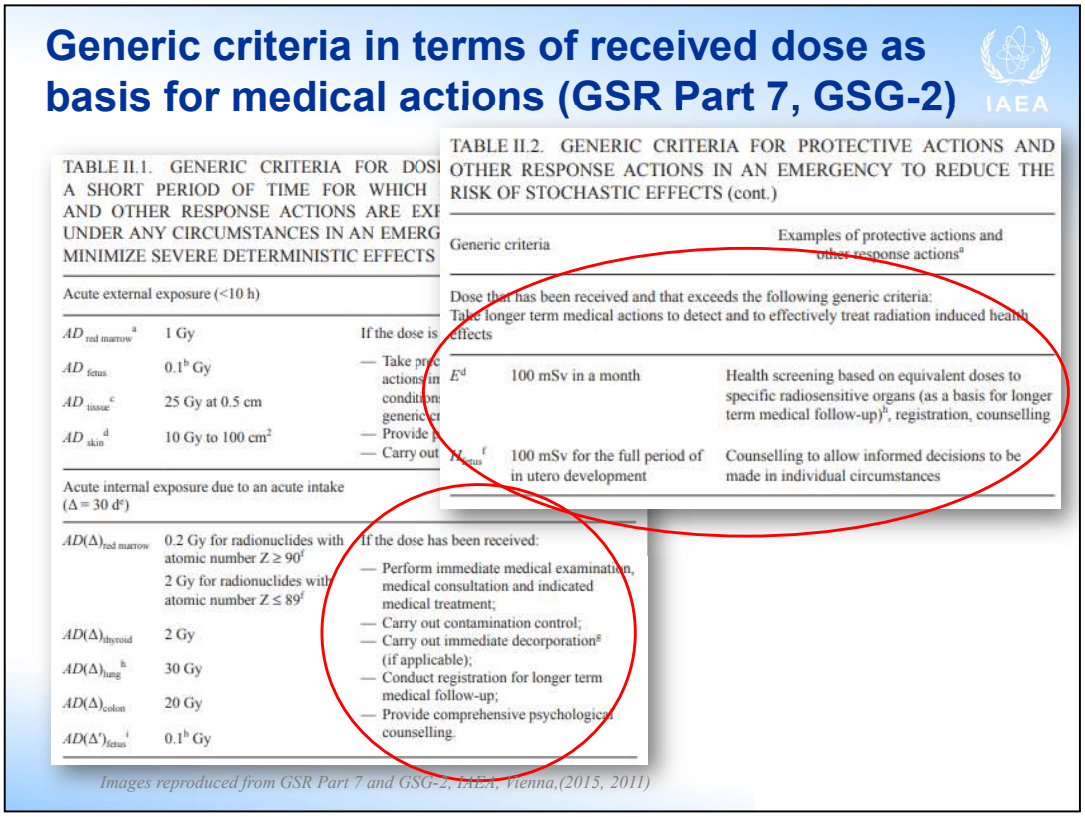


Lecture notes:

The medical follow-up should have the following objectives:

- Provide for the long term medical care for individuals who have suffered deterministic effects and for those who incurred doses that exceed the threshold dose for deterministic effects;
- Provide for the early detection and diagnosis of stochastic effects (e.g. thyroid cancer) among the exposed population in order to allow for effective treatment.

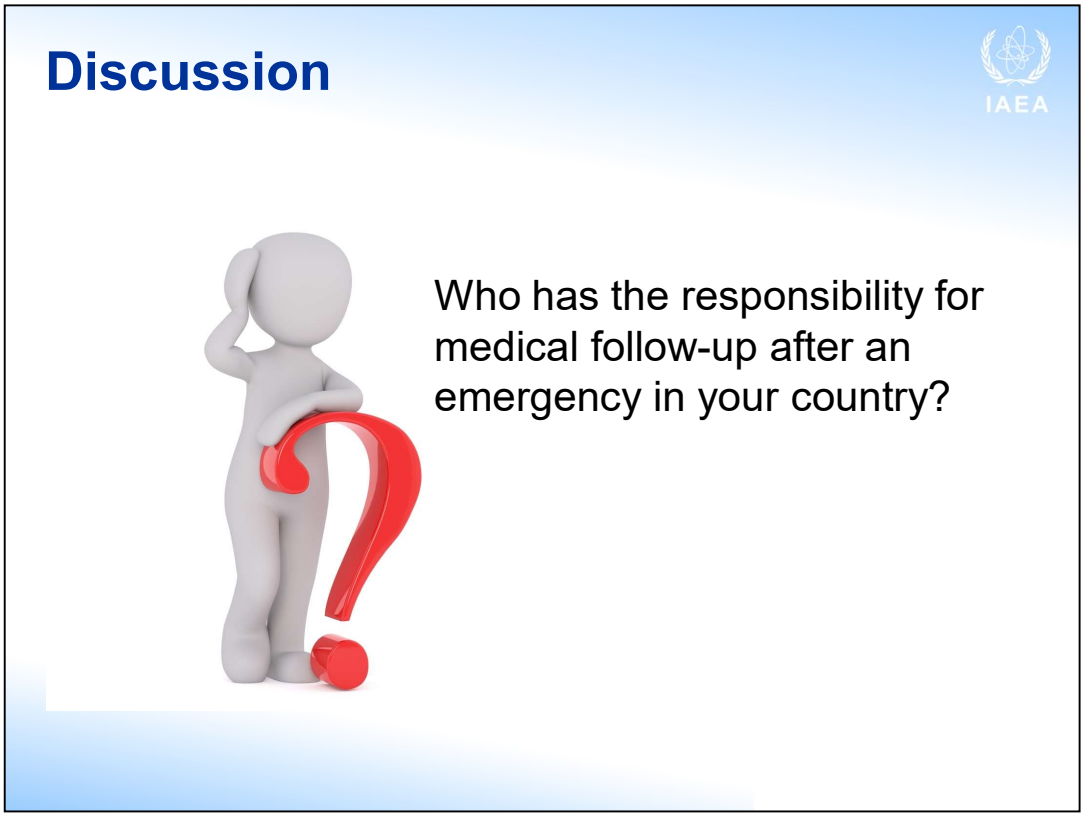
The objectives of medical follow-up and mental health and psychosocial support should be clearly explained to those involved to ensure that the expectations among all relevant parties are appropriate.



Images reproduced from GSR Part 7 and GSG-2, IAEA, Vienna,(2015, 2011)

Lecture notes:

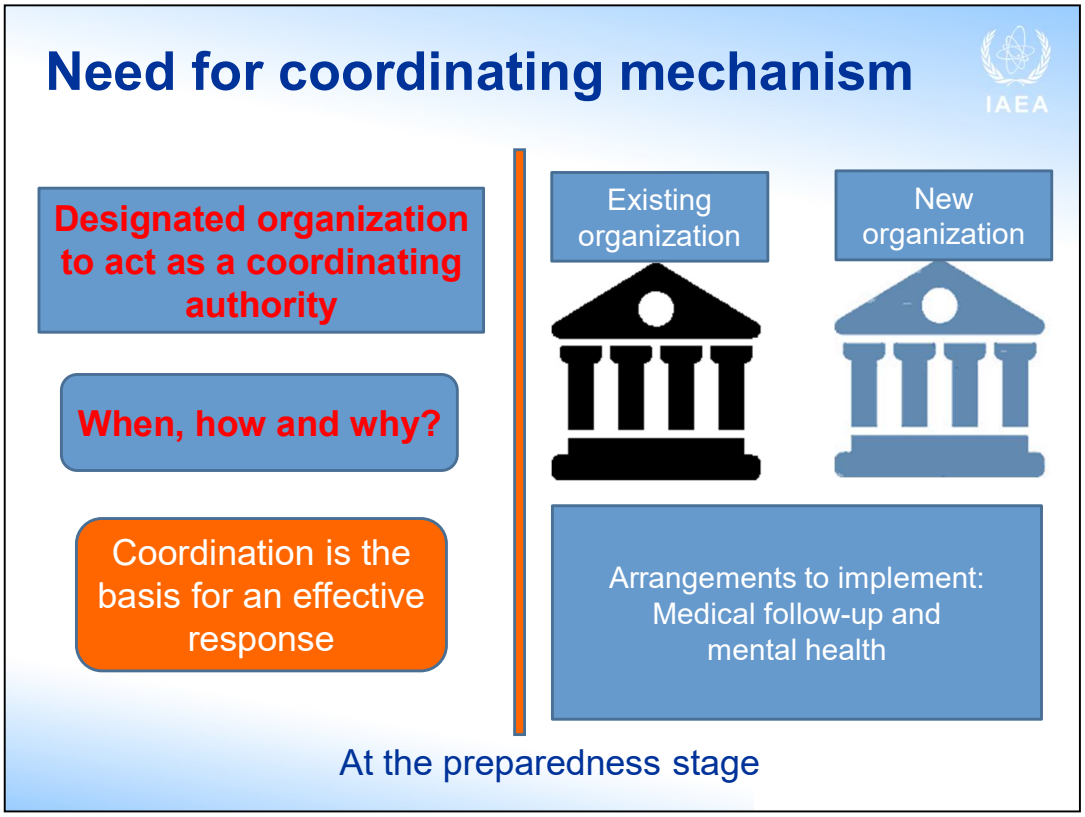
The generic criteria provided in GSR Part 7 and GSG-2 in terms of received doses provide the basis for initiating adequate medical actions. They can relate to health screening, medical treatment, decorporation or longer term medical follow-up to detect early, and to treat effectively, radiation induced cancers.



Lecture notes:

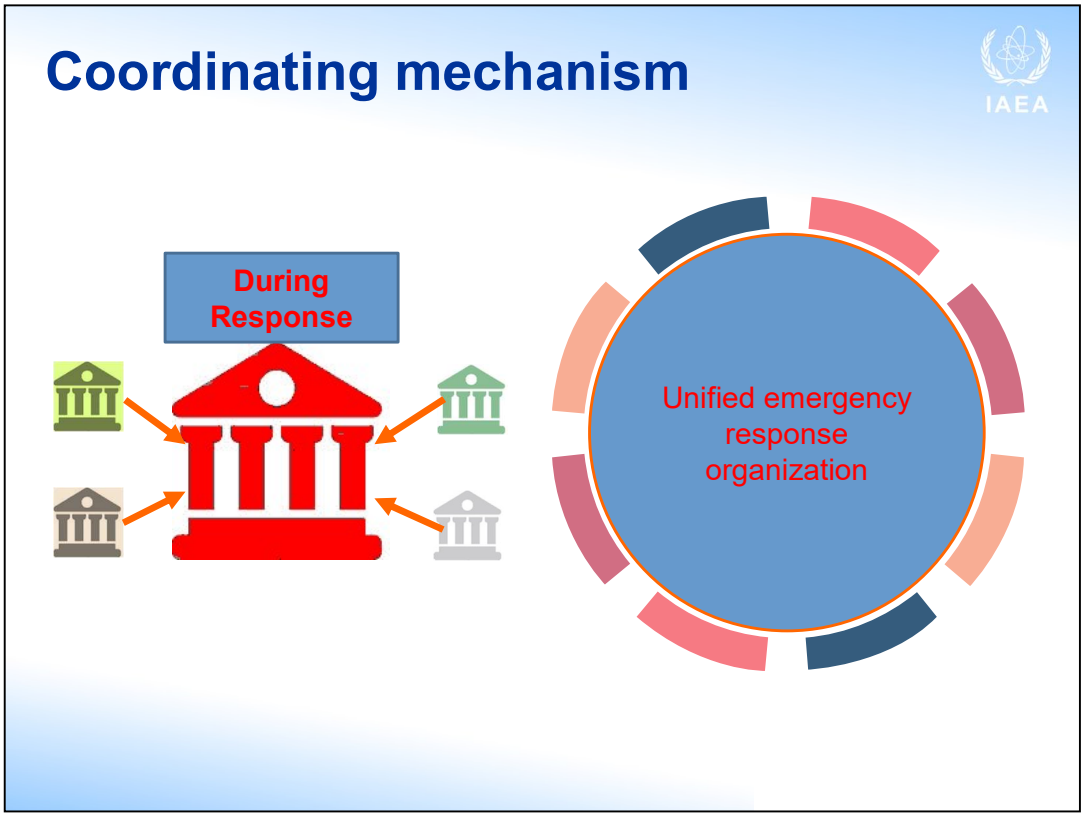
Allow for about 3 mins. of discussion.

The discussion should make the participants aware that many organizations may have some role ro play, and they all should be coordinated both at preparedness and during the response. Aspects that may be raised in addition include any differences that may exists when individuals warranting such medical actions are members of the public and workers, including emergency workers.



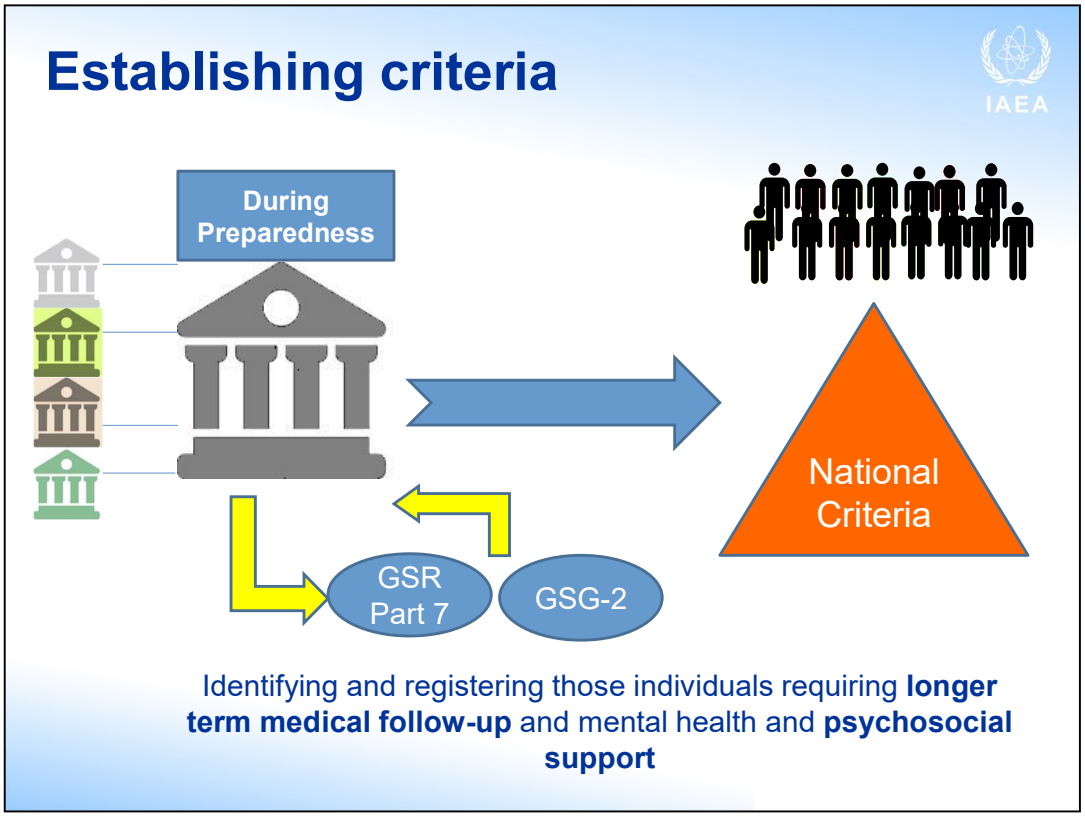
Lecture notes:

The mechanism for coordinating the necessary arrangements to implement the medical follow-up and to provide mental health and psychosocial support following a nuclear or radiological emergency should be identified at the preparedness stage. The coordinating mechanism may involve an existing organization that is designated to act as a coordinating authority in this area or a newly established body consisting of representatives from authorities in public health, radiation protection, emergency management, epidemiology and other relevant authorities. The coordinating mechanism should coordinate arrangements to be put in place at the preparedness stage by the relevant organizations with responsibilities in medical follow-up and in the provision of mental health and psychosocial support.



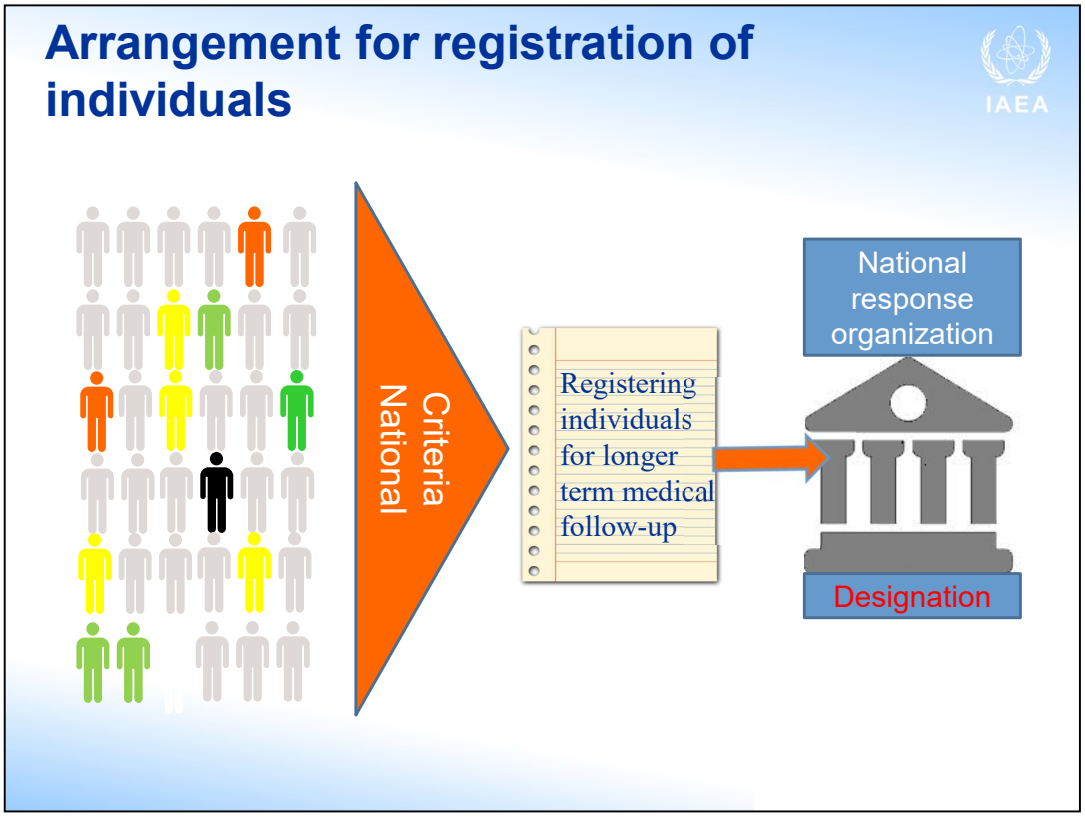
Lecture notes:

The coordinating mechanism should allow the coordination of actions by relevant organizations within a unified emergency response organization during an emergency response.



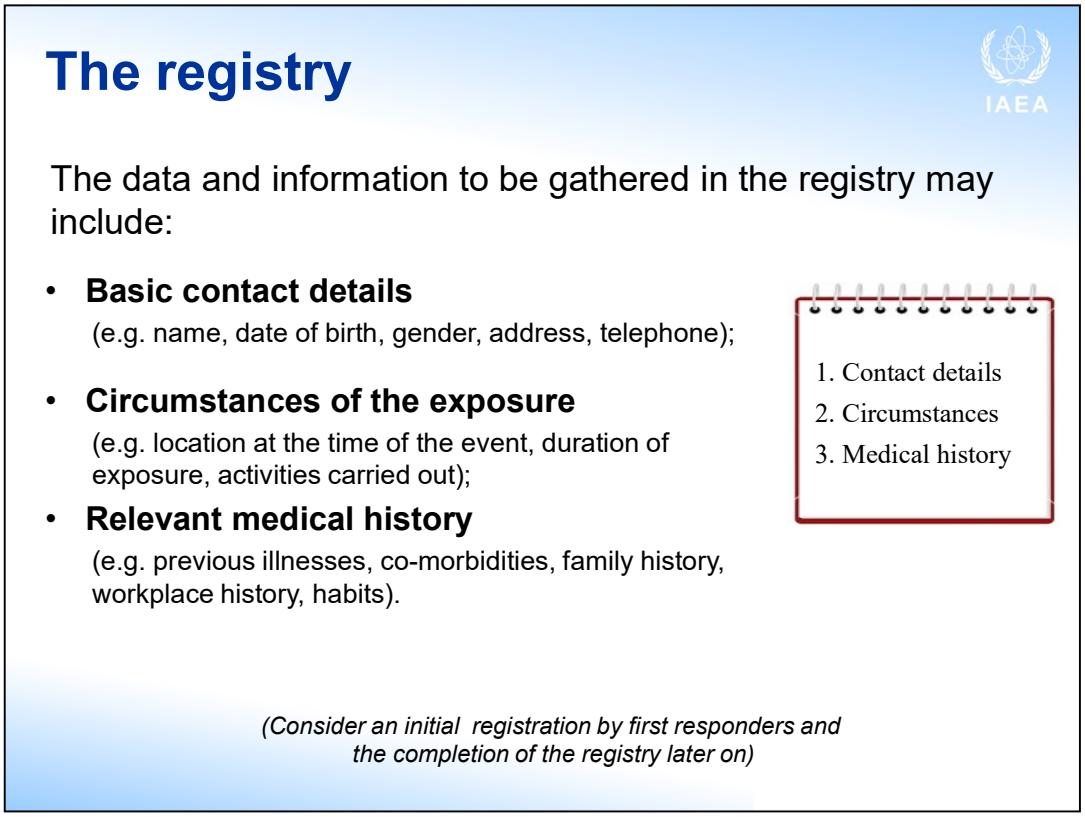
Lecture notes:

The responsible authority within the coordinating mechanism should, at the preparedness stage, establish criteria for identifying and registering those individuals requiring longer term medical follow-up and mental health and psychosocial support. These criteria should take into account the relevant criteria set out in GSR Part 7 and GSG-2 and should be subject to agreement by all relevant authorities.



Lecture notes:

Once the national criteria have been established, they will help authorities to identify which individuals should be registered for a long term medical follow-up. This also implies that a national response organization should be designated in order to keep the registers and take actions accordingly.



Lecture notes:

The data and information to be gathered in the registry should be determined at the preparedness stage and may include: basic contact details (e.g. name, date of birth, gender, address, telephone number); information on the circumstances in which exposures occurred during the emergency (e.g. location at the time of the event, duration of exposure, activities carried out); and any relevant medical history (e.g. previous illnesses, co-morbidities, family history, workplace history, habits). An initial registration should be carried out by employers or first responders that would allow for completion of the registry later on. Arrangements should be made for transferring information to the organization designated for the maintenance of the registry.

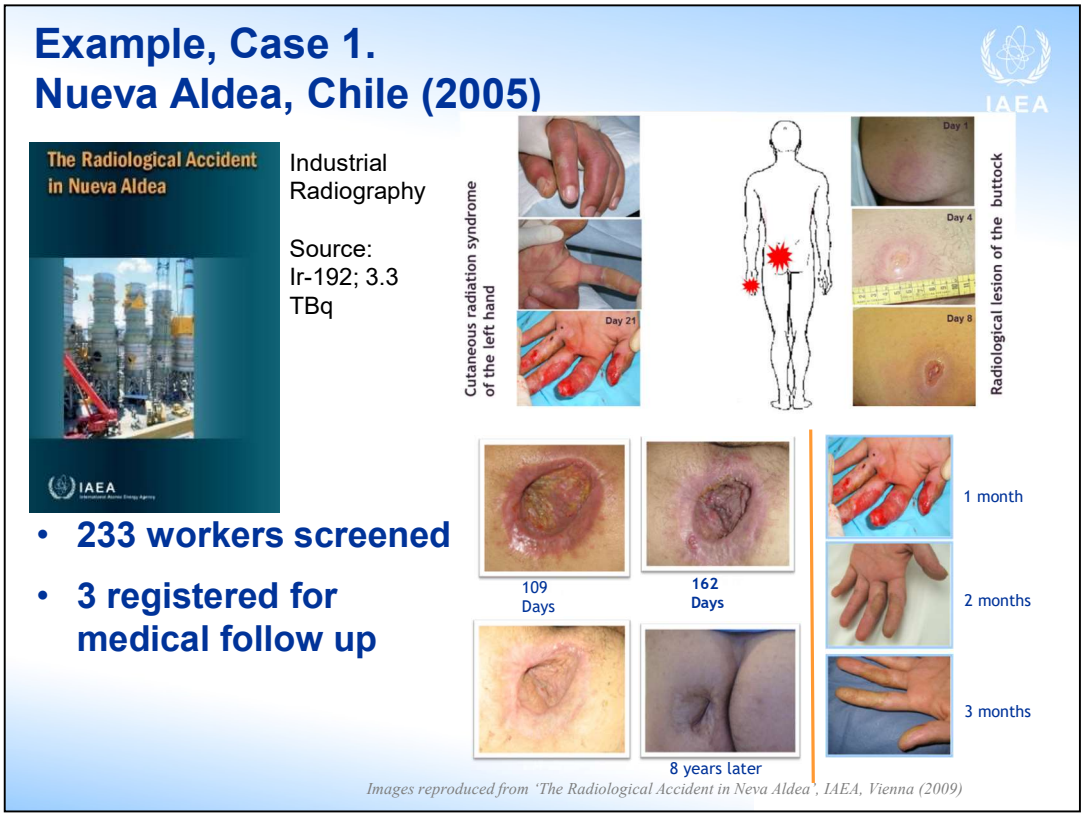
Provision of information

- Registered individuals to be provided with the necessary information, including but not limited to:
  - **Reason** for their selection;
  - **Assessed doses** and associated **health risks;**
  - **Contact point** in the designated institution;
  - **Record** of the procedures and laboratory tests;
  - **Symptoms** that may eventually present and whom to consult;
  - Offer for **psychological support.**

(Comply with the usual conditions of doctor-patient confidentiality and store the records accordingly)

Lecture notes:

Registered individuals should be provided with the necessary information, including but not limited to: the reason for their selection for longer term medical follow-up; assessed doses and associated health risks; a contact point in the institution responsible for the medical follow-up; a record of the procedures and laboratory tests performed, if appropriate (e.g. radiological and clinical assessments, blood tests); a description of symptoms that may eventually present and whom to consult in case of the presentation of symptoms. These individuals should also be given the opportunity to ask questions and be offered psychological support. The information on a patient's dose received, as well as his or her medical history and records, should comply with the usual conditions of doctor-patient confidentiality and should be securely stored for the period of time established by the health authorities.



Lecture notes:

A serious radiological accident occurred in Chile on 14 December 2005, when, at a cellulose plant under construction, a radioactive source containing Ir-192 fell unnoticed out of a gamma radiography equipment and was later found and handled by three scaffolding workers.

Photos are showing the evolution of local radiation injuries at the most exposed worker in this accident.

Under the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, the Chilean authorities requested assistance from the IAEA in terms of advice on the dose assessment and medical management of those involved persons in the accident.

In response to public pressure, the authorities conducted an assessment to identify individuals who may have been exposed to the source at levels that would require medical follow -p (i.e. those who may have conducted activities within 10 m from the unshielded source) and carried out further assessment, screening and blood sampling.

Lecture notes:

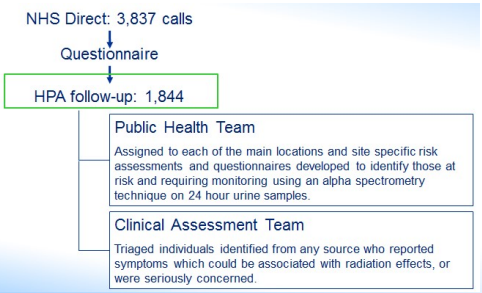
Only three workers out of 233 were registered and subjected to longer term medical follow-up.

In the absence of clear criteria for registration and medical follow-up, the impact on the health system would be huge if all individuals who may have been involved in an emergency would be subjected to unnecessary medical follow-up.

FIG: Clinical evolution of the buttock necrosis after MSC therapy (courtesy: Hôspital d'instruction des armees Percy, CTSA, IRSN, France), and Clinical evolution of the left hand of worker A (17 January 2006), International Atomic Energy Agency, The Radiological Accident in Neva Aldea, IAEA, Vienna (2009)

Example, Case 2.
Polonium incident, UK (2006)

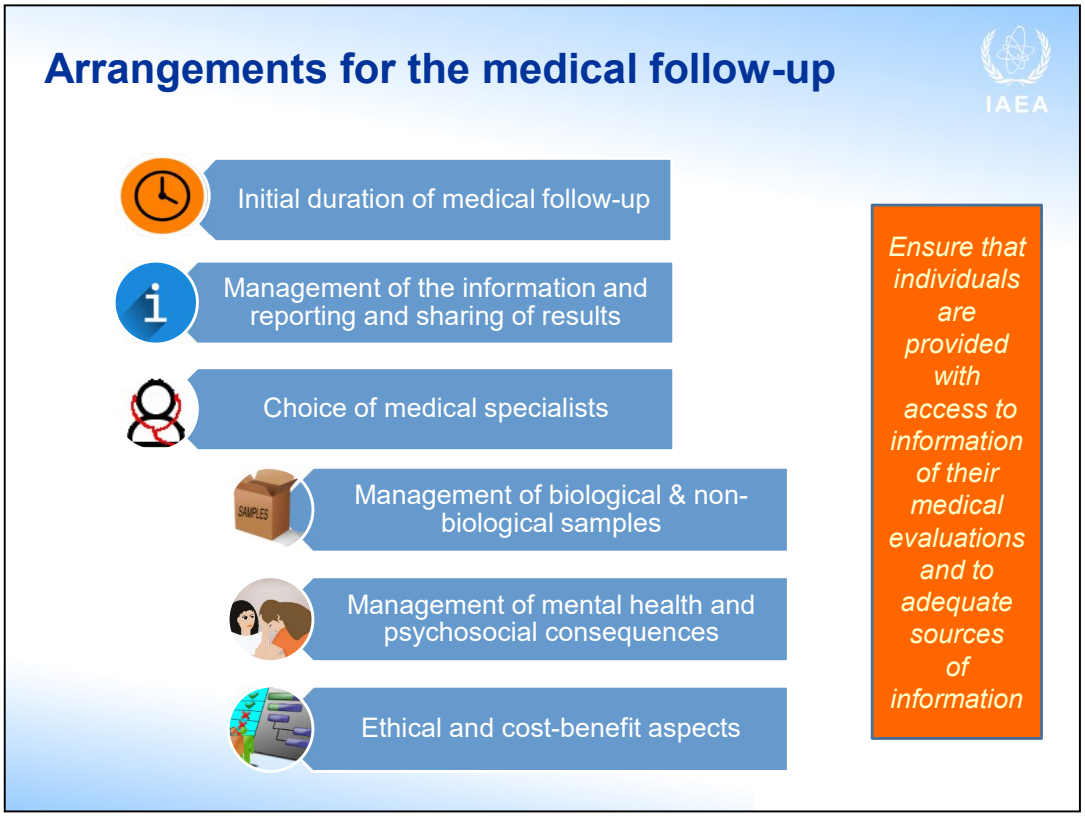
- Major challenge to identify individuals who may have been involved and may require medical follow-up:
  - Information gathering to support monitoring, assessment and registration relied heavily on public involvement through an effective public communication mechanism:



- Utilizing a call centre, questionnaires at first stage;
- Performing monitoring and assessment at second stage to determine who may need to be registered for medical follow-up;
- No individual exceeded the criteria for subjecting to longer term medical follow-up.

Lecture notes:

The polonium incident that took place in 2006 in the UK shows that identifying those individuals involved and those among them who may require longer term medical-follow up may pose a major challenge in the response to the emergency. Without adequate preparedness and clear criteria, doing so would not have been possible.

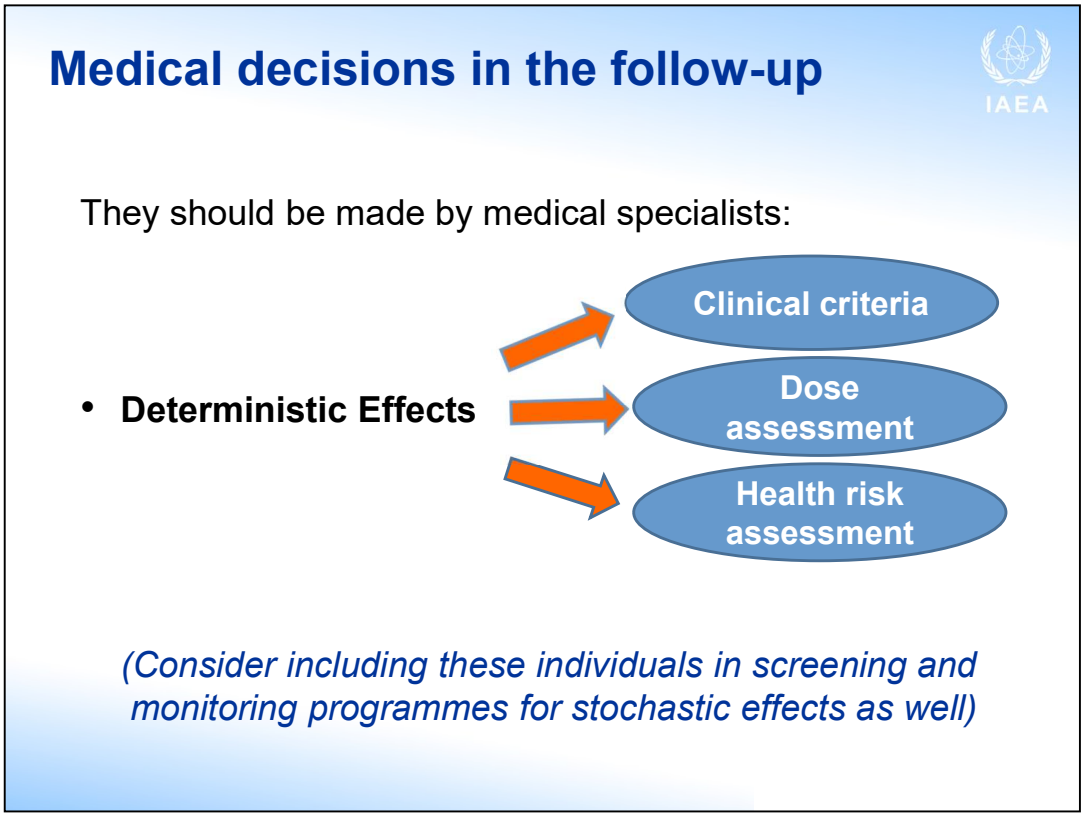


Lecture notes:

As part of the arrangements for the medical follow-up, the following should be considered:

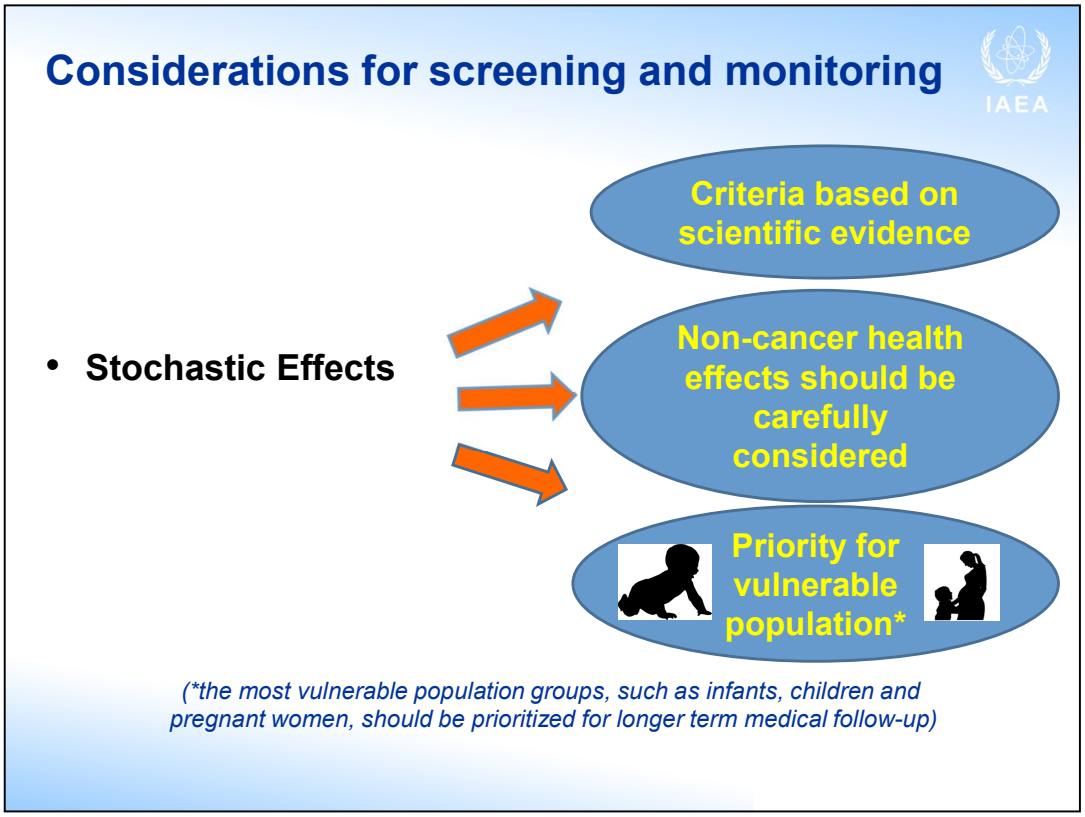
- The initial duration of the medical follow-up;
- The management of the information and the reporting and sharing of results;
- The identification of medical specialists to be involved in the medical follow-up;
- The management of biological and non-biological samples;
- The management of mental health and psychosocial consequences;
- Ethical and cost-benefit aspects.

Arrangements for longer term medical follow-up should ensure that individuals are provided with access to information about the results of their medical evaluations and to adequate sources of information, such as health care providers.



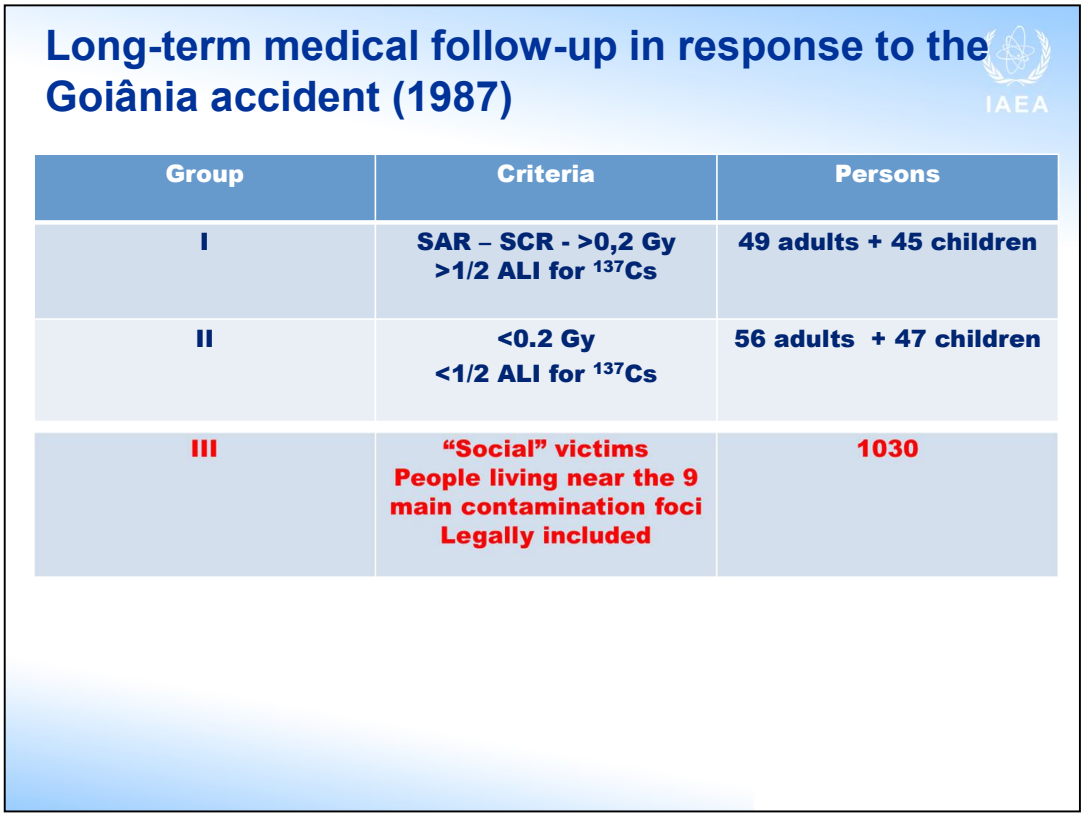
Lecture notes:

The decisions on the medical follow-up of individuals in relation to deterministic effects should be made by medical specialists on the basis of established clinical criteria, with consideration of the assessed doses and individual health risk assessments. Consideration should be given to including these individuals in screening and monitoring programmes for stochastic effects as well.



Lecture notes:

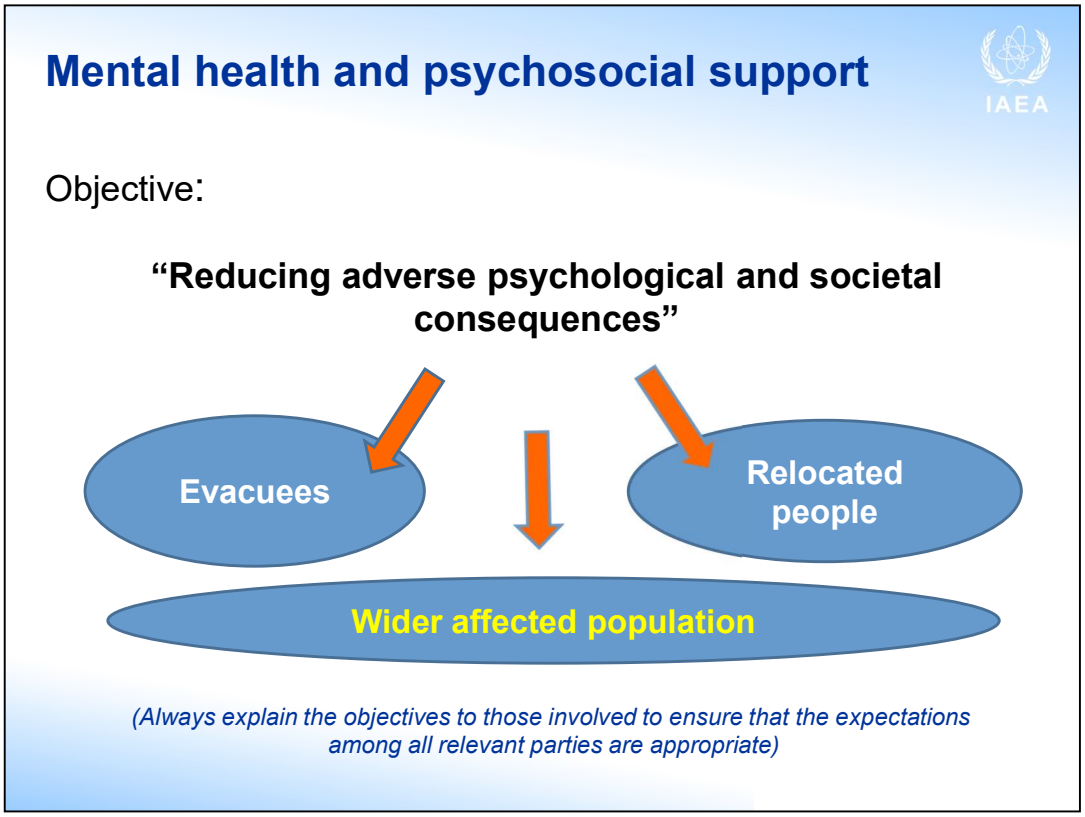
Screening and monitoring programmes for stochastic effects should be based on criteria supported by sound scientific evidence for observing an increase in the incidence of cancer among the exposed population. The inclusion of non-cancer health effects in the monitoring programme should be carefully considered. In case of limited resources, the most vulnerable population groups, such as infants, children and pregnant women, should be prioritized for longer term medical follow-up.



Lecture notes:

There were two groups in the aftermath of the Goiânia accident who were identified as warranting medical care and follow-up. The first group comprised 49 adults and 45 children who suffered from acute radiation syndrome or local radiation injuries (i.e. deterministic effects). The second group comprised 56 adults and 47 children who did not present any deterministic effects, but the assessment indicated that they were in risk of sustaining radiation induced cancers in the future and, thus, needed to be subjected to longer term medical follow-up.

But this was not sufficient. The major group that called for medical attention was the biggest one and comprised individuals (so called 'social victims') who were not exposed in the accident but were so worried about their health and well-being that a legal decision was made to consider them for longer term medical follow-up. However, subjecting such a large group of individuals to longer term medical follow-up is not the best way of helping them to cope with the adverse psychological consequences. Instead, provision of mental health and psychosocial support should be considered, as discussed in the next slides.

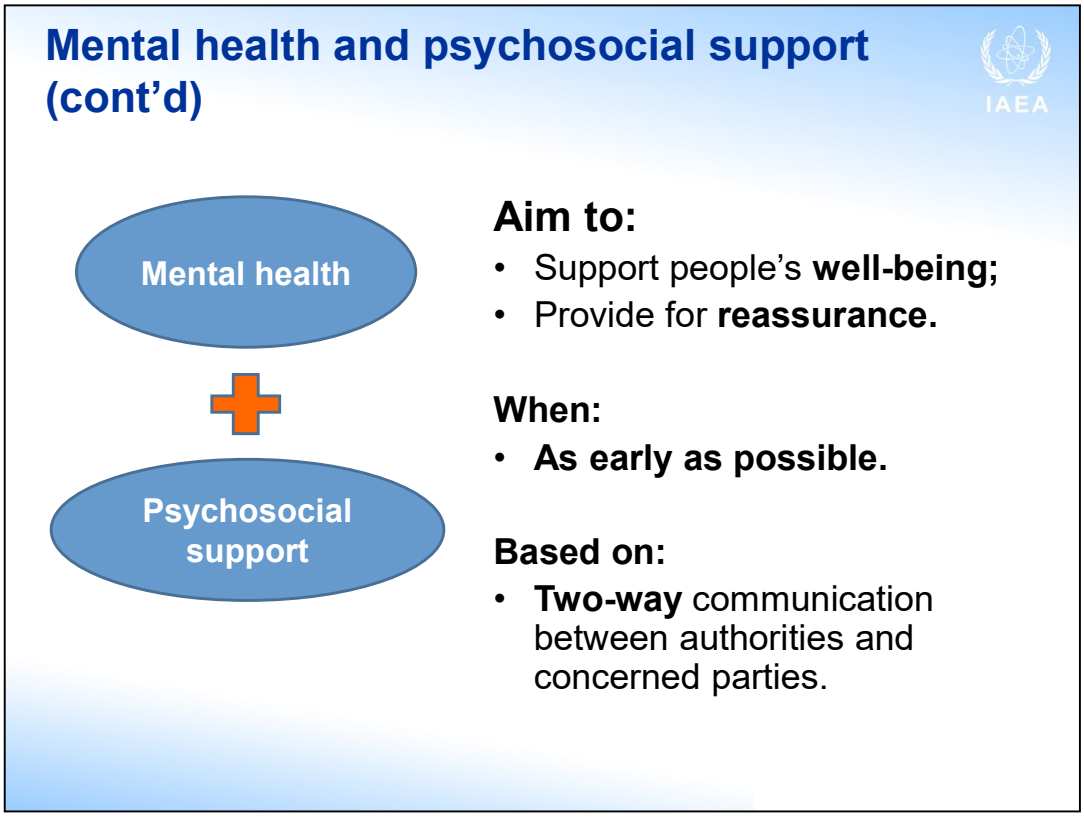


Lecture notes:

The mental health and psychosocial support in the aftermath of a nuclear or radiological emergency should have the objective of reducing adverse psychological and societal consequences for the wider affected population, such as evacuees, and people relocated after a decision to lift the evacuation and/or relocation has been made, even if radiation induced health effects cannot be observed among them (This is in addition to those who have been overexposed and suffering from deterministic effects or are subjected to longer term medical follow-up as discussed earlier). The objectives of medical follow-up and mental health and psychosocial support should be clearly explained to those involved to ensure that the expectations among all relevant parties are appropriate.

References:

1. International Atomic Energy Agency, Arrangements for the Termination of a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSG-11, IAEA, Vienna (2018).



Lecture notes:

Arrangements should be made to provide mental health and psychosocial support for people being evacuated, relocated or returning to live normally in the affected area and to support their well-being. In this, people's life styles and their need for reassurance following a nuclear or radiological emergency should be taken into account. Such arrangements should allow for facilitating two-way communication between the authorities and concerned parties.

The provision of mental health and psychosocial support should start as early as possible in the response, e.g. with the activation of the emergency response and the issuing of orders for evacuation or other public protective actions, on the basis of effective public communication mechanisms that target the main concerns of the people. These activities should be part of the unified command and control system.

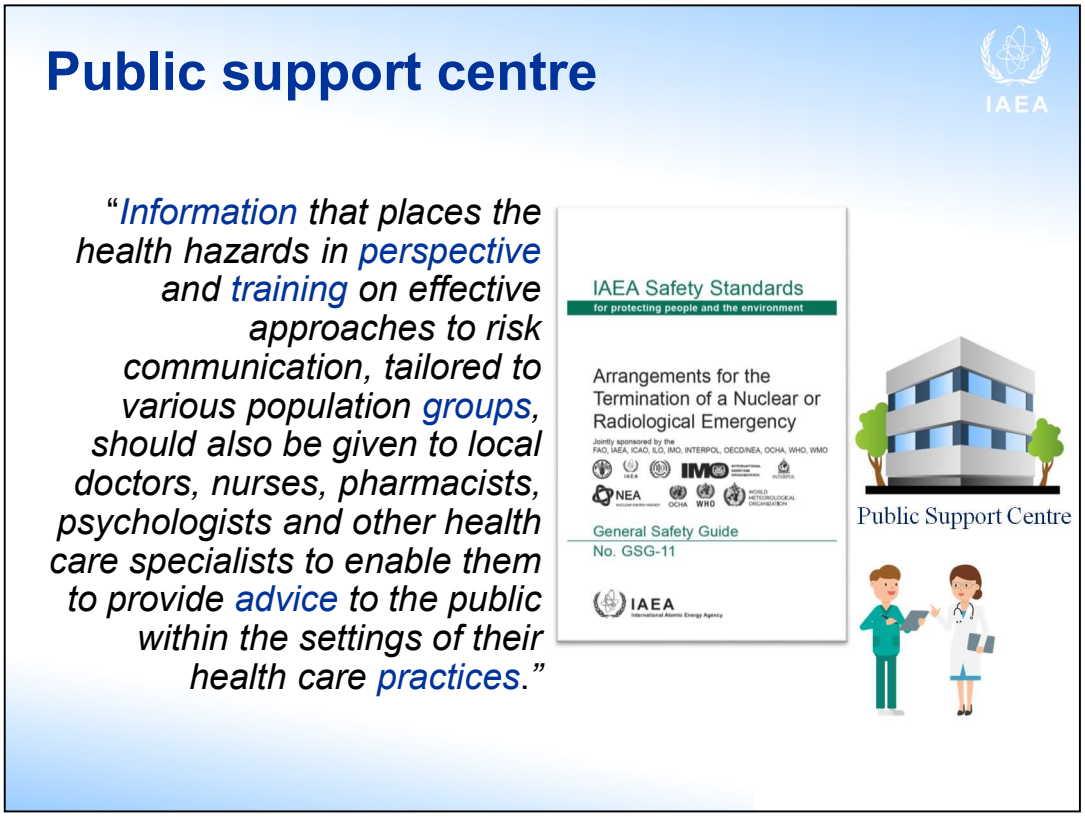
Mental health and psychosocial support (cont'd)

- Provision of mental health and psychosocial support is common for all emergencies:
  - Highlights the importance of all-hazards approach;
  - WHO guidance available:
    - WHO, UNHCR, mhGAP Humanitarian Intervention Guide (mhGAP-HIG): Clinical Management of Mental, Neurological and Substance Use Conditions in Humanitarian Emergencies, WHO, Geneva (2015).
    - WHO, WAR TRAUMA FOUNDATION, WORLD VISION INTERNATIONAL, Psychological First Aid: Guide for Field Workers, WHO, Geneva (2011).
    - IASC, IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings, IASC, Geneva (2007).

Lecture notes:

References:

1. World Health Organization, United Nations High Commissioner for Refugees, mhGAP Humanitarian Intervention Guide (mhGAP-HIG): Clinical Management of Mental, Neurological and Substance Use Conditions in Humanitarian Emergencies, WHO, Geneva (2015).
2. World Health Organization, War Trauma Foundation, World Vision International, Psychological First Aid: Guide for Field Workers, WHO, Geneva (2011).
3. Inter-Agency Standing Commmittee, IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings, IASC, Geneva (2007).



Lecture notes:

As part of the arrangements, the establishment of a public support centre for the affected populations should be considered. Local doctors, nurses, pharmacists, psychologists, respective experts from public universities and associations, and others who are in positions of trust and who have the respect of the community should be considered for participation in the work of the public support centres. Information that places the health hazards in perspective and training on effective approaches to risk communication, tailored to various population groups, should also be given to local doctors, nurses, pharmacists, psychologists and other health care specialists in order to enable them to provide advice to the public in the settings of their practices.

Public support centre (cont'd)

Training on effective approaches

GSR Part 7

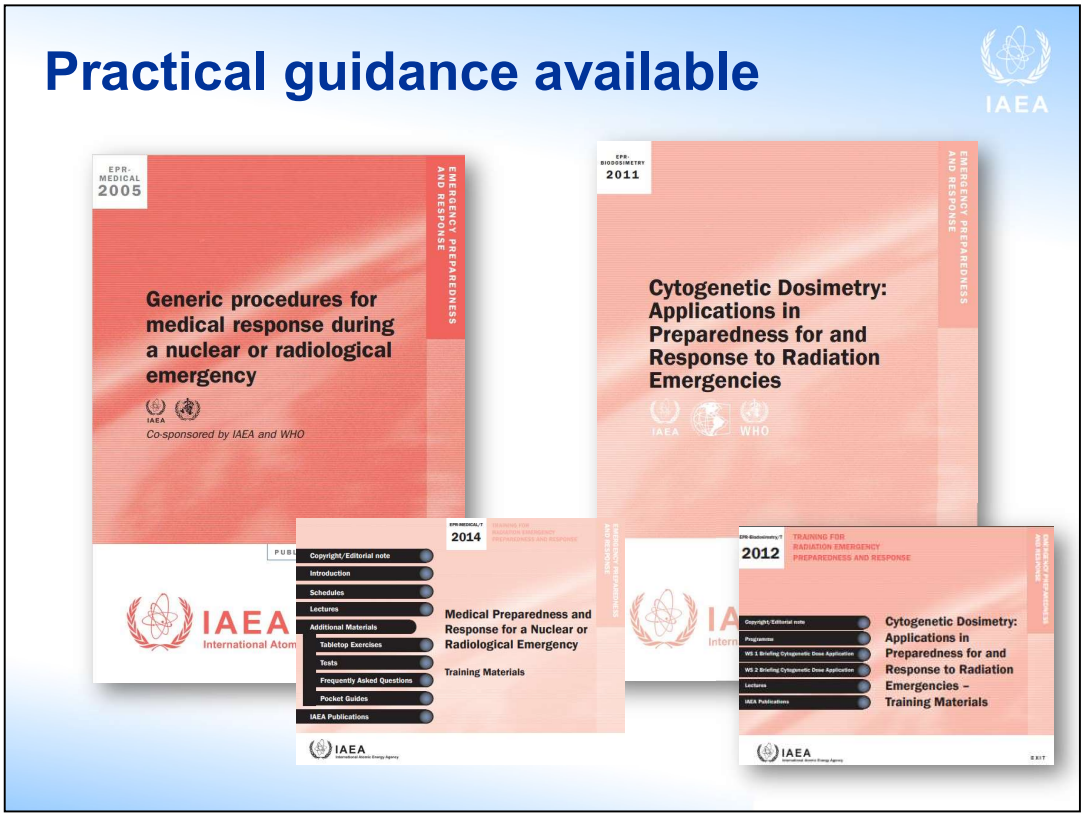
- Mental health and psychosocial support;
- Information that places the health hazards in perspective;
- Risk communication tailored to various population groups;
- Advice to the public within the settings of their health care practices.

Discussion

Are arrangements for the provision of mental health and psychosocial support following a nuclear or radiological emergency made at the national level? How well are the relevant authorities prepared?

Lecture notes:

Allow for about 3 mins. of discussion.

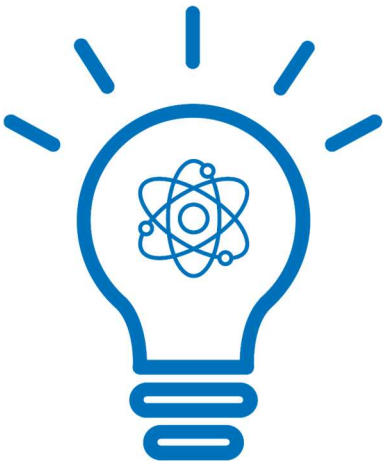


Lecture notes:

This is a reminder that practical guidance is available for Member States to consider when developing comprehensive medical preparedness and response arrangements as required in GSR Part 7:

1. International Atomic Energy Agency, World Health Organization, Generic Procedures for Medical Response during a Nuclear or Radiological Emergency, EPR-Medical 2005, IAEA, Vienna (2005) and the associated training materials.
2. International Atomic Energy Agency, Pan American Health Organization, World Health Organization, Cytogenetic Dosimetry: Applications in Preparedness for and Response to Radiation Emergencies, EPR-Biodosimetry 2011, IAEA, Vienna (2011) and the associated training materials.

Summary



- Provision of adequate medical support to affected populations and individuals is paramount in the aftermath of a nuclear or radiological emergency.
- Arrangements to enable effective implementation of medical follow-up and the provision of mental health and psychosocial support following a nuclear or radiological emergency should be made at the preparedness stage.
- Medical response should be integrated within the overall emergency response effort for resuming normal social and economic activity.

Lecture notes:

Summarize the three major points of the presentation.

Lecture notes:

Thank you!