FIFTH COORDINATION MEETING OF WHO
COLLABORATING CENTRES IN
RADIATION EMERGENCY MEDICAL PREPAREDNESS
AND ASSISTANCE

(REMPAN)

Paris, France, 5-8 December 1994

WHO PLAN FOR
RADIATION EMERGENCY MEDICAL ASSISTANCE

Contents

DESCRIPTION OF THE PLAN

1. Background

The use of nuclear power, industrial, and medical applications of radiation and radionuclides occasionally give rise to radiation accidents. Some of these accidents have entailed overexposure, i.e. irradiation above the limits established for both the radiation workers and the public. Radiation injuries are often combined with other types of injuries.

The most frequent cause of serious radiation injuries is external radiation, usually from X-ray and radionuclide sources. Second in frequency is internal contamination with radionuclides. Reactor accidents are very rare. In general, the risk of serious health hazards from the use of nuclear power, radiation and radionuclides is much less than that from most of the major activities of man. Nevertheless radiation accidents, and in particular nuclear emergencies, even though rare, give rise to many medical, administrative, legal, social and psychological implications.

The Chernobyl accident gave a strong new impulse for further development of WHO activities in the field of radiation emergency medical preparedness. As a result of this activity, the network of WHO collaborating centres - REMPAN - has been established. This network is the main instrument of the WHO plan for radiation emergency medical assistance in case of a nuclear accident or other radiation emergency. But there is no base to consider that the process of creating a reliable system for radiation emergency medical preparedness has been completed. Needless to say that WHO will continue its activity in this field. The necessity to follow this direction is dictated by the spreading of the peaceful use of radiation, by the growing number of local military conflicts and terrorist acts Suffice to say that at present the total number of nuclear power reactors in the world is 430, 55 reactors are under construction. A huge quantity of radioactive waste has been collected in nuclear enterprises. And this is only a part of the potential threat of radiological disasters.

2. Need for international cooperation

Each Member State of WHO should have its national plan of preparedness for radiation emergencies and for medical assistance to the affected persons. Such a plan should be backed by adequate capability for putting it into effect. In fact, only a limited number of countries are able to carry out the wide range of actions on the medical handling of a radiation emergency Such actions may include health-related assessment of the accident, sorting, decontamination, transportation, diagnosis, treatment and follow-up of a large number of people. Thus, there is a need to strengthen the ability of each Member State to cope with radiation accidents through an international mechanism. Such a mechanism should allow for the following considerations

- The diagnosis and treatment of radiation accident injuries must be planned for and undertaken in specialized centres. Besides the risk of radiation emergencies is low Thus the establishment of such a centre on a national level in every country is hardly justified Instead it appears reasonable to establish a global network of several specialized centres with international responsibilities.

- Population overexposure can also occur following transboundary radioactive releases.

- Scientific data on effects of overexposure at a national level are accumulated slowly due to the low frequency of radiation accidents. Pooling of these data could speed up the development of more effective techniques for diagnosis and treatment of overexposured persons.

The Chernobyl accident gave strong support for that approach. The responses in Europe were generally timely and vigorous in safeguarding public health. At the same time, the accident revealed many shortcomings at both national and international levels Neither internationally nor in many countries, were there adequate contingency plans for such an accident and the WHO European Regional Office had to establish rapidly a system whereby data on radiation and on public health measures were submitted by Member States and disseminated to focal points in other countries. There was an initial lack of coordination and exchange of information.

The USSR was able to render medical assistance to affected persons at the reactor and to the population around the reactor site by mobilizing its own extensive material, scientific and health service resources. Had such an accident happened in a country which had not specialized institutions and expertise on radiation pathology, the impact of the accident would have been much greater without large-scale outside assistance.

3. Medical actions to be taken

There is a wide range of conceivable accidents or incidents which could occur (Table 1). At one extreme, there is the possibility of a major release of radioactive material from a nuclear reactor, leading to significant exposure of personnel as well as the public within and beyond the borders of the country in which the accident occurred. In this case, the role of WHO would be to organize large-scale assistance, under the terms of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, including the management of exposed individuals and the development of measures to limit health effects. An international medical assistance team might be organized which may encounter all three main categories of radiation overexposure:

a) There is external irradiation only - the patient presents no danger to emergency personnel and protective measures are limited to the removal or shielding of the source itself.

b) The patient is, in addition, externally contaminated - exposure of the patient continues until the contamination is removed, protection of personnel is required and further contamination of both the patient and his/her environment must be prevented.

c) In addition, internal contamination takes place - the patient also needs treatment to reduce internal irradiation. The body and excreta may contain significant radioactivity. Nuclear activation may be regarded as a particular case of internal contamination.

Either category of exposure may be associated with other injury (trauma, burns) which could be life-threatening.

Prompt medical intervention may be necessary to:

- limit exposure by removal or isolation of the patient from the source of external radiation, by decontamination and by prevention of further contamination;

Table 1

Major roles of Collaborating Centres within REMPAN in possible radiation emergency situations

Type of accident	Roles of the Collaborating Centre
A major release of radioactive material from a nuclear reactor	- to provide assistance and advice in the management of exposed individuals; - to provide a team for on-site emergency treatment; - the transfer (if possible and necessary) of severely exposed patients to collaborating centres for specialised medical care; - a survey team for rapid external radiation monitoring and/or contamination surveys with appropriate equipment; - facilities and staff for medical investigations and treatment; - to assist in the development of measures necessary to limit health effects; - to follow-up medical supervision and treatment.
The loss of high activity sources leading to severe exposure of some individuals	- visit the accident site in order to identify and isolate the source of irradiation; - an assessment of likely exposure; - recommendation of appropriate medical treatment - transfer of patients in specialized medical facilities (if necessary and requested); - assist in the development of procedures to strengthen the countries abilities to manage such accidents for themselves;
Excessive exposure of patients and/or medical staff due to the administration of radiation for medical purposes	- to circulate information relating to such incidents for the benefit of member states in general

The Chernobyl accident gave strong support for that approach. The responses in Europe were generally timely and vigorous in safeguarding public health. At the same time, the accident revealed many shortcomings at both national and international levels. Neither internationally nor in many countries, were there adequate contingency plans for such an accident and the WHO European Regional Office had to establish rapidly a system whereby data on radiation and on public health measures were submitted by Member States and disseminated to focal points in other countries. There was an initial lack of coordination and exchange of information.

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Either category of exposure may be associated with other injury (trauma, burns) which could be life-threatening.

Prompt medical intervention may be necessary to:

- limit exposure by removal or isolation of the patient from the source of external radiation, by decontamination and by prevention of further contamination;

undertake treatment of other injury, particularly involving disturbances of vital functions;

administer stable iodine, radioprotective drugs, or other pharmacologic agents if indicated.

Initial treatment which may involve decontamination and/or "life support" can be carried out in a local hospital with an emergency department, decontamination facilities and monitoring equipment Transportation of patients from the site of the accident should take into account the needs of the patient and the problems of containment of contamination.

All relevant patient data should properly be recorded from the outset and be maintained throughout in order to provide information for diagnosis and treatment planning. The Pre-computer Case Report developed by the Coordinating Centre in Ulm may be used as an illustration Continuous updating of the assessment of exposure and radiation effects is necessary in order to classify patients according to degree of exposure.

Patients identified as having received significant exposure and requiring specialized treatment should be transferred to a designated medical centre with appropriate medical and radiological expertise. Some countries maintain a standby medical support team, including health physicists, which would be involved in the event of an accident. Countries lacking this capability may call upon international medical assistance

A more likely accident in countries where administrative control of radioactive materials may sometimes be less stringent, is the loss of high activity sources, such as those used in radiotherapy or in industrial radiography, leading to severe exposure of some individuals. Several such accidents have occurred, sometimes with a considerable delay between the onset of exposure and the identification and retrieval of the source. In this case, it might be necessary to:

- establish contacts with the local authorities responsible for managing the emergency, using any available means of communication ranging from telephone and E-mail, to televideocommunication.

- visit the accident site to identify and isolate the source of irradiation from contact with people;

- make an assessment of likely exposures, and recommend appropriate medical treatment, including where necessary the immediate transfer of patients to specialized medical facilities;

- support the country's abilities to manage the accident by its own means.

From time to time accidents occur in the administration of radiation for medical purposes, leading to excessive exposure of patients and/or medical staff. These incidents are less likely to give rise to requests for assistance to WHO, but WHO could usefully circulate information relating to such incidents for the benefit of Member States in general.

4. Responsibility of WHO for promoting international cooperation in radiation emergency preparedness and assistance

Medical preparedness and assistance in radiation emergencies should be regarded as part of the overall system for radiation safety and protection. Much work in this field is being done by the IAEA.

It plays a central role in the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. Specific tasks of WHO in the family of UN Organizations are to address those problems which lie within the competence of health authorities and/or are directly relevant to the medical community in Member States. These problems include the preparedness of medical services for handling radiation emergencies and the practices in diagnosis, treatment and follow-up of overexposed persons.

For many years, WHO has been collecting and distributing information on cases of overexposure, and on techniques for its diagnosis and treatment; organizing meetings for exchange of information, coordinating efforts in this field and elaborating recommendations for Member States; issuing publications on this subject and disseminating them among Member States; stimulating training of personnel dealing with the medical handling of radiation emergencies and victims, etc In carrying out these activities, WHO has collaborated closely with ILO, IAEA, UNSCEAR, and other international bodies as well as with many national institutions. In May 1988, the World Health Assembly took a decision to accede to the Assistance Convention. WHO's accession to both Conventions indicates that WHO is competent to act as the directing and coordinating authority in international health work in matters covered by the Conventions and to provide related assistance upon the request or acceptance of Governments The WHO plan for radiation emergency medical assistance is reflected in the Emergency Notification and Assistance Technical Operations Manual (ENATOM) developed by IAEA as a guide for State Parties to the Conventions.

5. Preparedness of WHO for radiation emergency medical assistance

The preparedness of WHO includes

- the ability of WHO to fulfill its commitments in accordance with the Assistance Convention; and

- the availability of a network of WHO Collaborating Centres which might render assistance including medical practices and other relevant operations.

5.1 Convention

By 17 November 1994, 74 States/Organizations were parties of the Early Notification Convention and 70 States/Organizations were parties of the Assistance Convention

The WHO function under the Early Notification Convention entails the obligation to notify IAEA of its competent authorities and contact points.

WHO functions under the Assistance Convention are summarized in a Table 2.

In accordance with para.1, Article 2 of the Assistance Convention, WHO is one of the appropriate international intergovernmental organizations which may be called for assistance. The request may come directly to WHO (to WHO Headquarters or to a WHO Regional Office) or through IAEA (para. 1 and 6, Article 2). For adequate response to the request and for subsequent exchange of information, WHO should have

a) appropriate means of communication and
b) facilities for processing the information.

- points of contact at WHO Headquarters and Regional Offices with the use of common means of communication; and

- recorders for telephone messages.

The WHO computerized radiation emergency databank should contain information on:

- points of contact at the WHO Regional Offices, relevant international intergovernmental organizations (IAEA, WMO, UNEP, FAO, UNSCEAR), Member States, relevant WHO Collaborating Centres and national institutions which have appropriate facilities and are able to render medical assistance;

- a list of managers and specialists in Member States whose support is likely to be sought in a radiation emergency situation requiring medical assistance,

- type of assistance which could be rendered through WHO;

- the main capabilities of WHO Collaborating Centres which could provide assistance;

- medical actions to be taken;

- necessary information to be provided, if possible, by a country requesting assistance;

- the WHO plan on radiation emergency medical assistance, as a whole,

- primary data in radiation pathology in a concise form.

It is important that the above information can be easily retrieved for rapid transmission to the country requesting assistance as well as to other addressees.

In the course of providing medical assistance, the WHO, using the computerized radiation emergency databank should continuously update the current information concerning the accident and progress in providing assistance. Easy access to the IAEA data bank should be ensured. In any exchange of information the requesting and assisting parties must protect any confidential information (Article 6 of the Assistance Convention).

In accordance with para 5(b) of the Article 14, WHO has to exercise the rights and fulfill the obligations which this Convention attributes to State Parties. Thus, WHO should be ready to respond as required by other provisions of the Convention unless appropriate reservations have been made beforehand

Table 2

WHO FUNCTIONS UNDER THE ASSISTANCE CONVENTION

Article	Abbreviated Text Replicate Convention Wording	WHO Functions
2.1	If a State Party needs assistance in the event of a nuclear accident ..... it may call for such assistance ..... from other .....international organizations	The WHO acts as a mean for communication between a State Party requested the assistance and REMPAN, IAEA and other State Parties involved in the medical assistance.
2.2	A State Party requesting assistance shall specify the scope and type of assistance required ..... in the event that it is not practicable for the requesting State to specify ..... the assisting party shall, in consultation, decide upon the scope and type of assistance required.	The WHO would, if necessary, help assist to a State Party requesting assistance to outline the scope and type of assistance required. For this purpose WHO is in position to provide a survey team for rapid evaluation of the situation on site, for external radiation monitoring and/or contamination surveys with appropriate equipment.
2.3	Each State Party to which a request for assistance is directed shall promptly decide and notify .... whether it is in a position to render the assistance requested...	The WHO would have to notify promptly the requesting state of the assistance, if any, that it was in a position to render.
3.(a)	....The assisting party should, where the assistance involves personnel, designate in consultation with the requesting state, the person who should be in charge of and retain immediate operational supervision over the personnel and the equipment provided by it.	The WHO should designate a person in charge for WHO teams which will provide with assistance on site
6.1	.... The assisting party shall protect the confidentiality of any confidential information	WHO's instructions for focal persons for radiation emergency must include these requirements.
6.2	The assisting party shall make every effort to coordinate with the requesting State before releasing information to the public....	
14.5(b)	In matters within their competence .... organizations shall.....exercise the rights and fulfill the obligations which this convention attributes....	Further development of REMPAN, organization of training courses, establishment of an appropriate data bank, communication system, working out of guidelines for radiation emergency medical preparedness and treatment and follow-up of radiation victims

5.2 The Network of WHO Collaborating Centres - REMPAN

For the promotion of radiation emergency medical preparedness and for practical assistance and advice to countries in case of overexposure from any source of radiation, WHO has established 8 Collaborating Centres: in France (International Centre for Radiopathology, Paris), in the USA (Centre for Radiation Emergency Assistance, Oak Ridge), in Russia (Centre for Medical Radiation Pathology, St Petersburg), in Australia (Centre for Radiation Protection and Radiation Emergency Medical Assistance, Melbourne), in Argentina (Centre for the Response to Ionizing Radiation Emergencies, Buenos Aires), in Brazil (Centre for Radiation Protection and Medical Preparedness for Radiation Accidents, Rio de Janeiro), in Germany (Centre for Radiation Emergency Medical Preparedness and Assistance, Ulm) and in Japan (Centre for Radiation Effects on Humans, Hiroshima).

These centres should serve as focal points for advice, training and possible medical care of radiation injuries; assist in the establishment of medical emergency plans for large-scale radiation accidents; initiate coordinated studies on human radiopathology and radiation epidemiology; and assist in the preparation of relevant documents, guidelines and meetings.

In the case of a radiation accident, the Collaborating Centres could provide a team for on-site emergency treatment; a survey team for rapid external radiation monitoring and/or contamination surveys with appropriate equipment; transportation of patients; facilities and staff for medical investigation and treatment; follow-up medical supervision and treatment. The experience and resources of the Collaborating Centres in France and the USA have already been used on several occasions for international help in radiation emergencies. The Centre in Japan, although irrelevant to emergency operations, can provide advice in follow-up overexposed groups and individuals.

The ultimate number of Collaborating Centres in the Radiation Emergency Medical Preparedness and Assistance (REMPAN) will hardly exceed 10. The limited number of Collaborating Centres would ensure close and efficient cooperation between them and WHO. Countries which do not have Collaborating Centres can be involved in the network through their "liaison institutions", i.e. national points of contact with the appropriate Collaborating Centre(s) and/or with WHO, including its Regional Offices. Contribution is also expected from "support institutions", i.e. such national institutions which could be activated or invited for solving particular problems, especially in an emergency situation. The REMPAN is a major mechanism for implementation of the WHO plan in case of a radiation emergency.

6. Provision of medical assistance through WHO

6.1 In the event of actual or suspected overexposure of persons, the authorities of the country affected can request for medical assistance from WHO either through IAEA or directly. In the latter case, it is preferable that WHO Headquarters would be contacted. However, the request may come through an appropriate WHO Regional Office or a relevant WHO Collaborating Centre (Fig.1). In that case, WHO Headquarters should be advised immediately so that necessary formal arrangements could be quickly finalized.

6.2 The telex or fax are the preferred modes of communication. Messages of all kind should begin with the code word "EMERCON" repeated twice.

6.3 Telephone calls in English are understood by all responsible officers. Depending on a person receiving the telephone call, French and Russian can also be tried out at WHO HQ, French at AFRO, Spanish at AMRO, Arabic at EMRO, French, Russian, and German at EURO, and Chinese at WPRO. Telex, telefax and telegrams should preferably be in English. A few other languages may be tried

(especially official languages at WHO and at its Regional Offices), but this may sometimes cause a delay in replying to the request.

6.4 The request should contain information in compliance with the check-list (see p. 54). If the information is seen at WHO as insufficient, the requesting country may be asked to provide, if possible, additional information.

6.5 If a request concerning a nuclear accident or radiological emergency comes directly to WHO it informs IAEA about it.

6.6 In its immediate reply to the requesting country, the WHO acknowledges the receipt of the request, informs the country about the type of assistance which will be sought by WHO from its Collaborating Centres and describes the Collaborating Centres which will be approached.

6.7 WHO alerts the REMPAN, transmits the message from the affected country and ask for assistance available.

6.8 The Collaborating Centres acknowledge receipt of the enquiry from WHO by return within three hours at maximum.

6.9 The Collaborating Centres advise their availability to assist as soon as possible, considering the nature and magnitude of the accident. Conditions and particularities for providing assistance, including legal and financial matters, may be discussed by telephone or by other rapid means of communication between parties concerned so that a way of providing assistance can be specified.

6.10 WHO immediately advises the requesting country about the assistance available and its conditions.

6 11 As soon as the requesting country decides to accept the offered assistance from a particular centre or centres, it officially notifies its decision to WHO and the collaborating centre(s). The country also identifies its institution(s) responsible for receiving assistance.

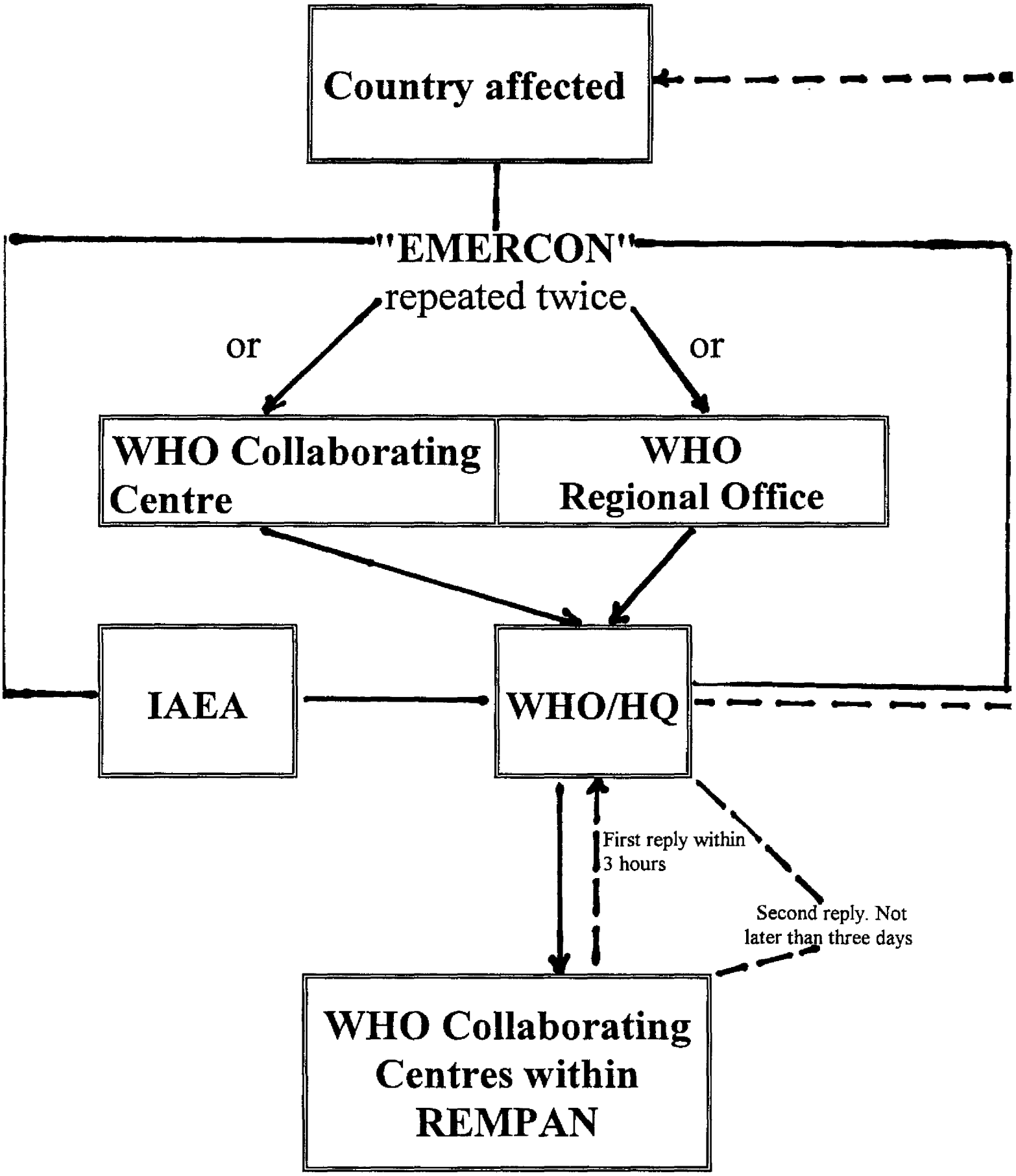
6.12 WHO informs all its Collaborating Centres about the outcome of the request.

6.13 Thereafter, the requesting country and assisting centre(s) communicate directly, copies being mailed to WHO; WHO keeps all its Collaborating Centres informed about the details of the accident and progress in its management.

6.14 Additional assistance may be organized from the same centre(s) or other Collaborating Centres as well as from national institutions supporting the network.

6.15 The requesting and assisting parties inform WHO about the termination of assistance.

6.16 WHO may help the parties with consultation in resolving disputes between them during the implementation of assistance as well as after its termination.


Country affected
"EMERCON"
repeated twice
or
or
WHO Collaborating Centre
WHO Regional Office
IAEA
WHO/HQ
First reply within 3 hours
Second reply. Not later than three days
WHO Collaborating Centres within REMPAN

Type of assistance which could be rendered through WHO is as follows:

Type	Brief Description of Type of Assistance
Human resources specialists	Each WHO collaborating centre, including support institutions has a few tens of specialists or more. There is a great proportion of medical doctors among them. Other specialists are health physics, radiology, radiochemistry, etc. A few specialists from each centre, mostly radiation medicine doctors, might be available for assistance on site. There are also skilled nurses and technicians.
Equipment	In some cases portable and mobile equipment for radiation monitoring of humans and of environmental objects might be available for use on site. Medical facilities for rendering assistance on site might also be delivered The centres have specially designed premises and are well equipped for providing special medical assistance to overexposed persons.
Medical Services & Medicine	WHO collaborating centres can help in the diagnosis, prognosis, treatment and follow-up of persons affected by radiation and by accompanying factors - both in the country affected and at the centres themselves.
Clothing	Special clothing for medical personnel might be supplied
Scientific Services	Expertise may be provided for reconstructing the circumstances of overexposure
Transportation	WHO collaborating centres might advise or render practical assistance on the transportation of affected persons
Recruitment of Experts	WHO could take on this task by inviting experts not only from its collaborating centres but also from other institutions, if necessary
Specialized Teams	WHO could organize multinational teams on rendering medical assistance on site.

7. Conclusions

7.1 WHO has a particular responsibility for the medical aspects of radiation emergency preparedness and assistance; this responsibility has been enhanced after WHO joined the Early Notification Convention and Assistance Convention.

7.2 Medical preparedness and assistance is regarded as part of an overall system of radiation safety.

7.3 To strengthen its ability to handle radiation emergencies, wherever they may happen, WHO has developed a network of its Collaborating Centres engaged in the Radiation Emergency Medical Preparedness and Assistance Network - REMPAN. At present 8 Collaborating Centres have been established.

7.4 The REMPAN should be the main instrument for the implementation of the WHO plan for radiation emergency medical assistance in case of a nuclear accident.

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