

Third Coordination Meeting of WHO Collaborating Centres
in Radiation Emergency Medical Preparedness and Assistance
(Leningrad, 21-24 May 1990)

REMPAN - RADIATION EMERGENCY MEDICAL
PREPAREDNESS AND ASSISTANCE NETWORK

1. Background

The use of nuclear power, industrial, and medical applications of radiation and radionuclides from time to time give rise to radiation accidents. A number 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, particularly nuclear ones, even though rare, can give rise to many medical, administrative, legal, social and psychological implications.

2. Need for international cooperation

Ideally, 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. In the Chernobyl accident 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 heavy 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. Thus, there is a need to strengthen the ability of each Member State to cope with radiation accidents. An international mechanism seems to be an efficient way for achieving it, for the following reasons.

- The diagnosis and treatment of radiation accident injuries must be planned for and undertaken in specialized centres having trained personnel and costly sophisticated techniques. In view of the low risk of radiation emergencies, the need to have such a centre on a national level in every country is hardly justified.
- 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 adverse effects from overexposure.

In view of the foregoing, it is reasonable to establish a global network of several specialized centres with international responsibilities.

3. Development of a Network of WHO Collaborating Centres

For the promotion of radiation emergency medical preparedness and for practical assistance to countries in case of overexposure from any source of radiation, WHO has established 6 collaborating centres (see Annex III): in France (International Centre for Radiopathology, Paris), in the USA (Centre for Radiation Emergency Assistance, Oak Ridge), in the USSR (Centre for Medical Radiation Pathology, Leningrad), in Australia (Centre for Radiation Protection and Radiation Emergency Medical Assistance, Melbourne), in Argentina (Centre for Radiation Emergency Response and Medical Assistance, Buenos Aires), and in Brazil (Centre for Radiation Protection and Medical Preparedness for Radiation Accidents, Rio de Janeiro).

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 Chernobyl accident demonstrated the importance of adequate advice in following-up overexposed groups and individuals. A vast experience in radiation epidemiology has been gained by the WHO Collaborating Centre for Radiation Effects on Humans (based on Radiation Effects Research Foundation, Hiroshima, Japan). Therefore, it is important that this centre has joined the 6 above-mentioned centres to form the kernel of the network. The ultimate number of collaborating centres in this field will hardly exceed 10. The limited number of collaborating centres would ensure close and efficient cooperation between them and WHO.

An initial step for setting up the network was the first Coordination meeting of Existing and Prospective WHO Collaborating Centres on Radiation Emergency Medical Preparedness and Assistance (Le Vésinet/Southampton, 1987). It was suggested at this meeting that 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 2nd Coordination meeting (Oak Ridge, October 1988) continued the work started at the first meeting. The meeting emphasized the necessity to accomplish the network of WHO collaborating centres so that the network would be a mechanism for implementation of the WHO contingency plan in case of a radiation emergency.

The 3rd Coordination meeting (Leningrad, May 1990) showed that the number of centres and the geographical coverage met the minimal requirements, ties between the Centres were close, the Centres cooperated with relevant institutions in many countries and the Centres were dedicated to rendering medical assistance or advice on follow-up studies. Thus the REMPAN can be considered as really existing.

4. Possible radiation emergencies and actions to be taken by collaborating centres in the network

There is a wide range of conceivable accidents or incidents which could occur, and which might invoke the support of one or more of the Collaborating Centres in the network. At one extreme, there is the possibility of a major release of radioactive material from a nuclear reactor, leading to significant public exposure, within and beyond the borders of the country in which the accident occurred. In this case, the role of Collaborating Centres would be to provide large-scale assistance including the management of exposed individuals and to assist in the development of measures necessary to limit health effects. A 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 the internal irradiation dose and his excreta may contain significant radioactivity. Nuclear activation may be regarded as a particular case of both external and internal contamination.

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

Prompt medical intervention might 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 or other radioprotective drugs if indicated.

Initial treatment which may involve decontamination and/or "life support" could be carried out in a local hospital with an emergency department, decontamination facilities and monitoring equipment. Continuous updating of the exposure assessment would be necessary in order to classify patients according to degree of exposure.

Patients identified as having received significant exposure and requiring specialized treatment might be transferred to a WHO collaborating centre with appropriate medical and radiological expertise.

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, a Collaborating Centre might be asked to:

- visit the accident site immediately, to identify and isolate the source of irradiation;

- make an assessment of likely exposures, and recommend appropriate medical treatment, including where necessary the immediate transfer of patients to specialist medical facilities;
- strengthen 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 to a Collaborating Centre, but the network could usefully circulate information relating to such incidents for the benefit of Member States in general.

5. Strengthening the capabilities of the Collaborating Centres

Widespread exchange of information should be continued, including accident reports, therapy experiences, meeting schedules, annual reports, training course schedules, scientific papers accepted for publication and newsletters. In fact, the collaborating centres now routinely exchange information about work in their own institutions.

The various Centres should cooperate with each other in arranging ad hoc as well as regular meetings of their staff whenever possible. A major objective of such meetings is to discuss and develop improved methods of dose assessment of radiation accident victims, and of their therapy. In addition, follow-up information needs to be disseminated to provide a realistic basis for health risk estimates and control of occupational and population exposures. Such exchanges should be on an annual basis and followed up by disseminating the acquired information to people who were unable to attend the meeting. A recent example is that in August 1990, the US Collaborating Centre will present two courses in Australia on the handling of radiation accidents - one on medical management and the other on the role of health physics.

The Centres should search for support, including financial, for exchanging staff and trainees with one another.

Other recommended activities could be:

- exchange of information on annual meetings and accident reports, bulletins, list of publications on a mailing list basis;
- transmittal of other information upon request;
- annual coordination meetings at each of the Collaborating Centres in turn;
- exchange of fellows on a bilateral basis.

6. Strengthening of the medical preparedness of the Member States for radiation emergencies

A major role for the REMPAN will be to assist Member States in strengthening their capabilities to handle radiation emergencies within their own countries and from their own resources.

Thus the participants in the REMPAN should:

- develop a body of reliable and authoritative guidelines and recommendations relating to planning for and the management of radiation emergencies;
- provide training courses and seminars on the management of radiation accidents, and on emergency preparedness;

- provide on-site advice and assistance in the planning and preparedness for radiation accidents/incidents;
- disseminate material developed within the network to appropriate liaison institutes within their own geographical region, and act as training sites, particularly for developing countries;
- encourage fellowships, especially for young applicants from developing countries and countries in the geographical region of the centre;
- identify their role in implementation of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;
- compile and periodically update information about the capabilities of the countries involved in the network, including information concerning means of receiving timely assistance should they require it.

7. Cooperation with other programmes and international organizations

Medical preparedness and assistance in radiation emergencies should be regarded as part of the overall system for radiation emergency preparedness and assistance. Thus, close collaboration with other international programmes and organizations such as IAEA, WMO, UNEP, etc., is highly desirable. WHO should however take a leading role in the medical aspects of radiation emergency preparedness and assistance. WHO Collaborating Centres could be used for reviewing documents relevant to this topic prepared for publication not only by WHO but also by other agencies.

8. Organization of medical assistance from the network

8.1 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. A request can also come to a Collaborating Centre which should inform WHO about it. The telex is the preferred mode of communication. Messages of all kind should begin with the code word "EMERCON" repeated twice.

The request should, if possible, contain the following information:

- source of radiation emergency (a reactor, radioactive source, X-ray device, radioactive fall-out, etc);
- external irradiation only or radioactive contamination;
- number of persons incurred;
- degree of radiation exposure (estimated doses, clinical signs, if any, etc);
- accompanying injuries, if any (wounds, burns, chemical intoxication, etc);
- type of assistance as best estimated by the country affected (diagnosis, therapy, decontamination, etc);
- the scope of assistance as best estimated by the country affected (advice by correspondence, supply of medicaments and devices, consultants on site, a medical assistance team, transportation of victims to a specialized centre abroad, etc.);
- the possibility to bear expenses, totally or partially;
- any other information which may help for assessment of the situation.

If the request comes to WHO or to its Collaborating Centre, WHO informs IAEA about it to receive confirmation of the accident.

8.2 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 Centre (see section 4) and describes the collaborating centres which will be approached (see Annex III).

8.3 WHO alerts the network of its collaborating centres in radiation emergency medical preparedness and assistance, transmits the message from the affected country and asks for assistance available. The collaborating centres acknowledge receipt of the enquiry from WHO within three hours.

8.4 The collaborating centres advise their availability to assist and specify a way of assistance as soon as possible but not later than three days. In the meantime, conditions and particularities for providing assistance, including legal and financial matters, could be discussed by telephone or by other rapid means of communication between parties concerned. WHO could organize multinational teams on rendering medical assistance on site.

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

8.6 WHO informs all its collaborating centres about the outcome of the request. Thereafter, the requesting country and assisting centre(s) communicate directly, copies being mailed to WHO. WHO might help the parties by inviting experts not only from its collaborating centres but also from other institutions, if necessary.

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

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

8.8 WHO might help the parties in resolving disputes between them during the implementation of assistance as well as after its termination.