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COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

Le Vesinet, France - 30-31 March 1987
and Southampton, UK - 1-2 April 1987

CONTENTS

Summary Report

1. Introduction

Partly as a consequence of the Chernobyl accident, WHO has decided to expand its activities in radiation protection (please see the Director-General's Report to the Executive Board in January 1987). In particular, it is intended that the programme on radiation emergency medical preparedness and assistance be strengthened. One useful approach would be the setting up a global WHO-coordinated network of institutions engaged in this field. The kernel of this network would be formed from a small number of WHO Collaborating Centres. A large number of national institutions throughout the world might then contribute to the network, coordinated through these collaborating centres.

At the present time there are three WHO Collaborating Centres of this character: in France, USA and USSR. The future network should enhance coordination between these existing centres and include some additional centres to provide a reasonable worldwide geographical coverage. This network would promote medical preparedness of Member States for radiation accidents and in the event of an accident, would be available to provide advice and medical assistance to the State or States affected, on the basis of the international Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. For accidents involving a significant number of casualties, a coordinated response would be substantially facilitated by the existence of the network.

Collaborating Centres and contributing national institutions forming the network would benefit by pooling their knowledge and experience.

Finally, it is envisaged that Collaborating Centres involved in the network would serve as focal points for communication, training and assistance in preparing Member States to handle radiation medical emergencies.

As a necessary step for creating the network, it was decided to convene a first Coordination Meeting of existing and prospective WHO Collaborating Centres on radiation emergency and assistance.

2. Description of the meeting

2.1 The main objectives:

- to inform each other about the main capabilities and recent developments in their centres, plans for the period of 1987-1988 and, if possible, plans for a more remote period;
- to get acquainted with the WHO Collaborating Centre in France, namely, the International Centre of Radiopathology;
- to outline a plan of coordinated actions for the period of 1987-1988;
- to acquire up-to-date scientific information at the seminar on "Nuclear Research Accidents, Preparedness and Medical Consequences", conducted by the British Congress of Radiology.

2.2 The course of the meeting

The final agenda of the meeting is set out in Annex I.

The total period of work was from 30 March to 2 April 1987. During 30-31 March the participants from six centres (cf. Annex II for the list of participants) worked at the SCPRI - Service Central de Protection Contre les Rayonnements Ionisants (Central Service of Protection against ionizing radiation) in Le Vesinet. They informed each other about their capabilities, and recent developments and plans in their centres and supporting institutions (Annex III). An outline for a suitable arrangement for a WHO-coordinated network is presented in Annex IV. The participants reviewed the activities and roles of the three existing centres and the capabilities and plans of the prospective centres (Annex V). The group visited the SCPRI and were informed in detail of its facilities and experience. The session in Le Vesinet ended with the preparation of a draft Report.

In the evening of 31 March the group moved on to Southampton where during 1 April the participants completed their Report and prepared a coordinated plan of action (Annex VI). The last day, 2 April was devoted to participation in the Seminar. During breaks the participants took the opportunity to see the Technical Exhibition organized on the occasion of the British Congress of Radiology.

3. Conclusions

3.1 The meeting contributed significantly to coordination of the activities and plans of the three existing WHO collaborating centres in France, USA and USSR.

3.2 Plans were discussed and formulated to establish two new WHO collaborating centres in Argentina and Brazil as well as to extend the functions of the WHO Collaborating Centre in Australia to the field of radiation emergency medical preparedness and assistance.

3.3 A document was prepared describing the existing and prospective centres, their staff, responsibilities and various avenues by which their assistance can be obtained in formulating emergency action plans and for the medical management of an actual radiation accident.

3.4 A document was prepared outlining a possible future network and necessary steps to be taken for its establishment.

3.5 A coordinated plan of action was developed, including a time-table for the most important milestones. The aim is to gradually build-up the network of WHO collaborating centres and cooperating national institutions for radiation emergency medical preparedness and assistance.

3.6 The group agreed that WHO should take prime responsibility for dealing with the medical aspects of radiation accidents.

3.7 The meeting was extremely productive and afforded an unusual opportunity to become acquainted with each other and with the French SCPRI, to resolve areas of misunderstanding and to identify steps to be taken to achieve six collaborating centres by the end of this year and about ten centres by 1990.

3.8 The group is committed to in work as rapidly as possible to reach the goals of the coordinated plan.

4. Acknowledgement

The members of this coordination meeting would like to acknowledge the support of the World Health Organization, and would like to express their gratitude to Dr Riaboukhine for his effective planning and management of the meeting.

We would also like to acknowledge the hospitality of the Director and Staff of the SCPRI at Le Vesinet and their appreciation of the opportunity to observe the activities of a fully operative Collaborating Centre.

Finally, we are grateful for the opportunity to participate in the Seminar on Preparedness and Medical Consequences of Nuclear Reactor Accidents, conducted by the British Institute of Radiology, and we thank them for their invitation.

ANNEX I

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March - 2 April 1987)

Agenda

Le Vesinet, France

Monday, 30 March

09.00 - 09.15	Opening of the meeting. Election of the Chairmen. Adoption of the agenda.
09.15 - 09.30	Introduction to the SCPRI (Professor J.P. Moroni)
09.30 - 12.30	Visit to the SCPRI and discussions on its experience
12.30 - 14.00	Lunch
14.00 - 15.30	Presentations of the participants on their current activities and plans
15.30 - 15.45	Coffee break
15.45 - 17.00	Discussion on the composition of the report to be produced by the Centres' representatives

Tuesday, 31 March

09.00 - 10.30	Elaboration of the report
10.30 - 10.45	Coffee break
10.45 - 12.30	Continuation of work on the report
12.30 - 14.00	Lunch
14.00 - 15.00	Discussion on preliminary draft report
15.00	Leave for Southampton

Southampton, U.K.

Wednesday, 1 April

09.00 - 10.30	Elaboration of the final draft of the report
10.30 - 10.45	Coffee break
10.45 - 12.30	Continuation of work on the report
12.30 - 14.00	Lunch
14.00 - 15.30	Discussion on the final draft of the report with the emphasis on the coordinated plan of action
15.30 - 15.45	Coffee break
15.45 - 17.00	Summing up of the report and results of the meeting

Thursday, 2 April

Participation at all-day seminar "Nuclear Reactor Accidents: Preparedness and Medical Consequences"

17.00 Closure of the meeting

ANNEX II

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March - 2 April 1987)

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ANNEX III

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March - 2 April 1987)

Capabilities and current activities at institutions forming a basis for the existing and prospective WHO Collaborating Centres

1. Existing WHO Collaborating Centres

1.1 France

The French Collaborating Centre, "The International Centre for Radiopathology" (CIR), is an officially recognized association of three institutions under the Presidency of Dr H. Jammet. These institutions are the Curie Institute, The Central Service for Protection against Ionizing Radiation (SCPRI) and the Commissariat for Atomic Energy (CEA).

a) The Curie Institute is essentially engaged in the eventual application of treatment after exact diagnosis. It should be noted that it is at this centre that Dr Jammet used in 1959, for the first time in the world, bone marrow transplantation for the Vinca accident victims.

b) The SCPRI, whose role it is to coordinate actions between the two other institutions, has built a nuclear infirmary which is able to receive up to 24 patients. This has been established because it is not easy to find vacant beds in a traditional hospital, and it is necessary to admit radiation patients immediately for one or two days in a medical ambiance to start adequate medical treatment. To achieve this, the SCPRI remains permanently on standby. The nuclear infirmary is equipped with surgical, radiological and dosimetric equipment and in order to maintain expertise, it is planned to manage two or three convalescent patients at a time who have undergone therapeutic whole body irradiation.

c) The CEA brings to this association the capability of reconstructing an accident in order to assess the physical and biological dosimetry a posteriori.

The French "CIR" has had considerable experience in the medical handling of radiation accidents. After the Vinca affair, it dealt with the Mol (Belgium) accident and then the Italian one. However, the most common cause of overexposure accidents was the loss of high intensity sources used in industrial radiography. For example in 1985 in Algeria a ^{192}Ir source was found by children at the side of a road. The mother kept the source about her person for some time and later deposited it in a drawer. She died because of irradiation. Two of her teenage daughters who slept near the drawer were severely exposed and spent several weeks in the Curie Institute. The children suffered minor whole body irradiation but, having played with the source, lost several fingers.

The Morocco case was also due to the loss of a radiographic source. All details on this affair, source location in the bedroom and recovery operations are published in the SCPRI annual report of 1984. Eight persons died; two were saved due to CIR action in Paris. It was the most serious overexposure accident before Chernobyl.

The Saintes affair in France was of a different character. In a hospital, a ^{60}Co teletherapy 6000 Ci source was manipulated with bare hands by skilled operators. As a result they both lost their hands. The conditions of the accident have not been elucidated.

In cases like those, the role of public health services is essential. The public health responsibilities cannot be transferred to any other bodies such as those involved in the production of sources of energy.

The points of contact are:

Dr Jammet
- President of the Centre

Professor Pellerin
- Director of SCPRI

Professor Chanteur
- Deputy Director of SCPRI

Professor Moroni
- Head of Radiophysics Dept., SCPRI

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1.2 USA

The Radiation Emergency Assistance Centre/Training Site (REAC/TC) belongs to the Department of Energy and it is operated by the Oak Ridge Associated Universities (ORAU). It is located in the Methodist Medical Centre of Oak Ridge which has the clinical capacity of 300 beds.

In FY 1986/87 (October 1985 to January 31 1987), 119 radiation-related events were brought to the attention of REAC/TS staff. These accidents, or misadventures, involved 230 persons exclusive of persons irradiated around the Chernobyl reactor. REAC/TS provided medical consultation and assistance in 86 of the 119 events including three deaths which occurred in radiation therapy patients who received overdoses of radiation. Five of the 86 events involved six persons accidentally exposed to industrial radiography sources and six others had misadministrations of radionuclides, occurring in clinical nuclear medicine suits. Cytogenetic analyses (Dr Gayle Littlefield) were conducted to determine dose estimates based on radiation-induced chromosome aberrations for a total of 14 persons suspected of being accidentally exposed to radiation.

Efforts failed to establish a follow-up programme to search for untoward effects from the many (about 4000?) environmental exposures (1984) of inhabitants of Ciudad Juarez, Chihuahua, Mexico. Working through the El Paso, Texas field offices (H. Ortega) of the Pan American World Health Organization Branch, REAC/TS (Dr Gayle Littlefield) provided cytogenetic (initial and follow-up) analyses for chromosome aberrations in 10 persons selected at the time of the accident as having been most exposed. More recently, cytogenetic analyses were provided for two additonal Juarez residents possibly exposed in the 1984 incident but not previously evaluated. These data were incorporated into the offical report of the accident made by the Mexican government. In the absence of clinically manifest radiation-induced disabilities in a populace striving to overcome under-employment, inflation, crowded housing and marginal sanitation, medical assistance was not needed and an epidemiological study was not feasible.

Active medical follow-up, including follow-up cytogenetic analyses, was continued in the case of the 1951 DOE-industrial plant "Y-12" accident victims. Five of the six survivors (two persons died previously of such common diseases associated with aging as cardiovascular disease and cancer) were given physical and laboratory examinations and found to be in good general health. The sixth person is under active medical care by a personal physician for lung cancer. Follow-up cytogenetic analysis also was provided to the survivor of the 1976 Hanford accident.

REAC/TS staff (Dr S. A. Fry and Ms A. H. Sipe) continued to conduct, with the Centre for Epidemiology of Oak Ridge Associated Universities, a surveillance (via telephone interview) of 3,146 persons previously employed at 36 Department of Energy industrial plant sites. Both morbidity and mortality are being searched for among these persons identified as having exceeded at least once the U.S. National Occupational Radiation limit of 5 rem (0.05 Sv). These data are being collected to test the hypothesis that the guideline, which has been in force since the early 1960s, is adequate for safe operation.

REAC/TS staff, in conjunction with staff of ORAU Medical Division, also conduct for the U.S. Food and Drug Administration (FDA) a programme that involves the manufacture, distribution and annual audit of the usage of the actinide-chelating drugs calcium and zinc DTPA (diethylenetriaminepentaacetic acid). Between 1 June 1985 and 31 May 1986, these drugs were used in the occupational medical care of 54 persons where incorporation of americium, plutonium, or other actinides was determined or suspected. In these annual clinical audits, evidence for adverse effects is still being sought. To date, the only reactions that have been identified are mild sporadic cases of transitory urticaria not requiring treatment and a rare case of "metal fume poisoning" after Zn-DTPA administration by aerosols. Dr K.F. Hubner, who recently left the REAC/TS staff to become Director of Diagnostic Imaging in Nuclear Medicine in the Department of Radiology, University of Tennessee, Knoxville, and REAC/TS staff members reported the DTPA experience at the workshop on chelation problems held in the Federal Republic of Germany in Hamburg.

A study on the historical update of past and recent skin damage radiation accidents underscores our urgent need for better non-destructive methods to define and quantitate radiation dose in skin damage cases, a need that has not yet been met in the U.S. The radiation accident registry at the REAC/TS programme is keeping close surveillance of the radiation accidents that have recently occurred in the U.S. and Canada in the clinical operation of the radiotherapy machines, Therac-25 and Therac-20, manufactured by Atomic Energy Canada, Ltd. REAC/TS staff are acting, in these cases, as medical consultants to the U.S. Food and Drug Agency, which has responsibility for the safety of X-radiation devices in the U.S. Recent press releases seem to substantiate that these accidents are related to computer generated/operator errors, a new kind of radiation accident in REAC/TS experience. Two types of accidents have been associated with the use of these machines: one, where the operator, while correcting an error in the computerized instructions displayed on the CRT device, called for radiation emission before the new data was entered into the computerized data base; and the other, wherein the computer-driven turntable that places a target in the path of the electron beam to generate X-rays failed to be completely in place before operation began. In both kinds of accidents, high doses (100 Gy) of deeply penetrating high-energy electrons were delivered to brain stem instead of skin in one case (fatal); to spinal cord instead of oesophagus in another (severe morbidity at this time); in another, to lung instead of skin post mastectomy (survival) and to the pelvic region (fatal). Licenses to operate these devices have been withdrawn in the U.S.

In the Chernobyl disaster, REAC/TS staff were placed on alert by the U.S. Department of Energy. Their services were offered through the U.S. State Department to the Soviet Government. This offer was declined by the Soviet Government but made use of by the U.S. State Department, whose Foreign Service needed assistance in gauging the severity of the radiation exposure problem at several of its embassies and consulates. As a result, REAC/TS staff (Dr C. Lushbaugh and Dr W.Burr, Jr.) assisted with visits to Bucharest, Warsaw, Moscow, Leningrad and Kiev. Radiation measurements were made, instructional staff seminars given and medical consultations were provided at these sites. Since then, REAC/TS staff (Dr Lushbaugh and Dr R. Ricks) participated in an International Symposium conducted by the American Medical Association (AMA) at the Pan American World Health Organization, Washington, D.C. Conference Centre. There, the Chernobyl medical experience was reviewed and an assessment was made of the U.S.' medical preparedness to handle comparable mass casualties in such a disaster. The AMA has plans to attempt to organize the county medical societies to meet the national need which now relies on spur-of-the-moment use of such U.S. Department programmes as DOE (REAC/TS), NRC, FEMA, DOD and regional university centres and private corporations, e.g. University of Cincinnati (Dr E. Saenger), University of Pittsburgh (Dr N. Wald), University of Pennsylvania and the Radiation Management Corporation (Dr R. Linnemann) and Peter Bent Brigham Hospital, Boston (Dr D. Drum). The staff at many other medical centres and hospitals have been trained at the REAC/TS courses (Dr R. Ricks) in radiation incident management.

These courses are held 10 times a year with the financial support and guidance of the Federal Emergency Management Agency (FEMA). During the more than 20 years of the training courses in which radiation accident drills and demonstrations are conducted, more than 1,000 physicians and surgeons have been trained along with equal numbers of nurses, paramedics and health physicists.

REAC/TS has plans underway, in cooperation with WHO, to provide staff for a radiation accident training conference in Mexico in May 1987.

At the time of writing this progress report (March 1987), 10 training courses are planned, with FEMA support, for the calendar year 1987. All are oversubscribed. In additon to these medically-oriented training sessions, REAC/TS is hoping to help overcome the "language" barriers that complicate addressing legal grievances and the other needs of radiation accident victims by providing instructional seminars for attorneys and their paralegal assistants.

1.3 USSR

The Central Institute of Roentgenology and Radiology, belonging to the USSR Ministry of Health, has accumulated a 30-year experience in radiation pathology. It has a staff of 700 and its activities in radiation protection include the protection of population and patients, the introduction of new methods for treatment of radiation injuries, medical supervision for late effects, and the examination and, if necessary, treatment of persons after radiation accidents.

The problems of environmental radioactivity are dealt with by the Institute of Radiation Hygiene.

A Scientific Board has been recently established to coordinate activities of various institutions involved in radiation protection. International cooperation takes place with East European socialist countries and with Finland. Supporting facilities for medical assistance in radiation emergencies have been set up in a number of regions in the USSR as well as in some East European countries.

Much attention is paid to the education of the public about the health implications of radiation as well as to the training of physicians and nurses in basic radiopathology.

2. Prospective WHO collaborating centres

2.1 Argentina

There are two institutions in Argentina responsible by law for ionizing radiation:

a) National Atomic Energy Commission (CNEA) which is responsible for nuclear plants, radioactive material (licensing, transportation, etc.)

b) Ministry of Health which through its Radiation Protection Department (Federal Model) is responsible for X-ray sources and linear accelerators (licensing, education, etc.)

Both organizations work closely together.

There have been two serious radiation accidents in Argentina. One of these occurred approximately twenty-five years ago with a ^{137}Cs industrial source. The other took place three years ago at a nuclear reactor, and the exposed worker died after 48 hours.

In 1984, both institutions, together with a municipality of the city of Buenos Aires which coordinates the civil defence for the entire country, agreed to establish a system to handle persons involved in radiation accidents. The agreement covers three important items:

a) repartition of duties in response to a radiation accident, including assignments for radiological emergency facilities and equipment;

b) elaboration of emergency plans for a radiation accident, which should describe its typical features and measures to be taken;

c) establishment of points of expertise and hospital facilities for preparedness and response.

The National Atomic Energy Commission has a capability to provide the physical reconstruction of the accident, means of decontamination, instrumentation and biological dosimetry. The Health Ministry will provide hospital facilities. The municipality of the city of Buenos Aires will coordinate the communication and transportation.

The Argentine Authorities appreciate the need for Argentina's participation in an international WHO network for medical handling of radiation accidents.

2.2 Australia

The Australian Radiation Laboratory (ARL) is operated by the Federal Department of Health. Its role is to:

a) conduct applied research and investigation into matters relating to radiation health (both ionizing and non-ionizing);

b) assist the states of Australia, who have constitutional authority over health matters, by providing advice, guidance and scientific services by:

- preparing Codes of Practice and Guidelines relating to radiation health
- promulgating national regulatory standards (usually derived from ICRP)
- maintaining national measurement standards for exposure, absorbed dose and radioactivity
- providing a TLD personal dosimetry system
- undertaking environmental monitoring on behalf of the states and at the national level
- maintain whole body monitoring facilities

The Laboratory functions at a national level by supporting a permanent committee (Radiation Health Committee) of the National Health and Medical Research Council, made up of the principal state radiation health officials, some additional experts, and a secretariat provided by ARL. The Director of ARL acts as chairman of the committee.

The Laboratory has a staff of 95 (40 professional scientists), a budget of A$4.5 million (US$3 million) and is quite capable in the fields of radiation measurement, dose assessment, and environmental monitoring in both ionizing and non-ionizing areas. In addition, it conducts frequent training courses in radiation protection, nuclear medicine (radiopharmaceuticals) and non-ionizing radiation measurement. It is, at present, a WHO Collaborating Centre for Radiation Protection. It is quite common for ARL to have staff attached from South East Asia, while they hold training fellowships from WHO and IAEA.

The Laboratory would be the first point of contact in the event of a radiation emergency, capable of providing dose assessments and advice on corrective actions and would serve as the "window" in Australia to medical services equipped to manage irradiated patients (via the Peter McCallum Hospital).

Peter McCallum Institute

This is Australia's foremost treatment centre for cancer therapy, with specialist skills in radiation therapy and the management of patients exposed deliberately to ionizing radiation. It has, or has close access to, relevant supporting services such as bone-marrow transplants, haemotology, cytogenetic dosimetry and can support patients requiring isolated nursing and other special services. It serves Victoria (about 4 million) and Tasmania (less than 1 million) as the single centralized facility for cancer therapy.

It should be mentioned that this Institute is also a teaching hospital of Melbourne University, conducting research into cancer therapy and providing post-graduate qualifications. It already serves as a radiation emergency reference point for the state of Victoria.

ARL and Peter McCallum Hospital would jointly fill the role of Collaborating Centre for Radiation Emergency Preparedness.

2.3 Brazil

Existing capacities of institutions upon which the projected Collaborating Centre could be based are as follows:

A. Institute of Radiation Protection and Dosimetry - IRD

Its main objectives are radiological control of nuclear installations and any other facilities which use radiosotopes and/or ionizing radiation; radiological control of workers; implementation of dosimetry standards for calibration of instruments used in radiodiagnosis, radiotherapy, radiation protection, industry and research labs.

The Institute is prepared to undertake area and personnel monitoring as well as to make dose assessments in the case of a radiological emergency. For this purpose the Institute has facilities and laboratories such as: secondary standard dosimetry laboratory, cytogenetic dosimetry laboratory, whole-body counter unit, excreta analysis laboratory, film and TLD dosimetry, fixed and mobile laboratory for environmental measurements.

B. Furnas Centrais Electricas SA (electricity company running the nuclear power station)

This company has its emergency centre at Mambucaba, near the reactor site, which has general facilities for first aid to overexposed personnel, various types of body radioactivity monitors, chemicals for skin decontamination and elimination of incorporated radionuclides, radioecological laboratory, trained MDs and nurses for radiological emergency assistance.

C. Empresas Nucleares Brasileiras, SA - Nuclebras (Company responsible for development of nuclear energy)

Its collaborative potential consists of 4 physicians (one trained at the International Centre on Radiopathology in France) and a data base, including information on accidents which occurred in the world

D. Marcilio Dias Naval Hospital

It is a 660 bed hospital with all main medical clinics and other facilities like a unit for burns treatment (16 beds) and heliport for easy transfer of patients. Of special interest is the Nuclear Medicine Unit, which occupies an entire floor of the building with six isolated and shielded rooms for treatment of radiation exposed or contaminated patients.

The available equipment (large field whole body gamma camera, linear accelerators, whole body counter, biplane cineangiocoronography, gamma scanners, tomographer, etc.) and personnel (6 nuclear medicine trained MD's and 8 trained technicians) render this hospital a suitable center for immediate assistance and treatment of radiation overexposure.

E. National Cancer Institute

It is a 300 bed general hospital and associated medical research institute of the Ministry of Health in Rio. Of the available facilities and services the following are relevant to the scope for a WHO Collaborating Center: complete immunogenetic laboratory for histocompatibility evaluation, bone marrow transplant unit (with 7 reverse isolation and 2 laminar flow rooms), blood bank for supporting bone marrow transplants including provision of irradiated blood products, and basic research laboratories including cytogenetics and cell culture investigations. The framework of the Cancer Institute is excellent for training purposes.

If the proposal for organizing a Collaborating Centre in Brazil is approved, the following activities are suggested for the period 1987/88:

1. official contacts with participating institutions to establish the procedures and organization matters;

2. definition of the functions and actions of each participating organization in Brazil;

3. participation in an intercomparison of the present biological dosimetry used at IRD with an appropriate WHO Reference Centre

4. reporting to the WHO International Reference Centre for Radioactivity on current measurements of radioactivity in environmental samples (i.e., milk, air and precipitation)

5. collection of information related to the previous radiation accidents in the country

6. scientific visits to existing Collaborating Centres to acquire experience gained by such centres

7. training of personnel

8. collection and dissemination of information

Annex IV

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March - 2 April 1987)

A scenario of the WHO-coordinated network for radiation emergency medical preparedness and assistance

1. Possible radiation emergency situations

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 assistance and advice in the management of exposed individuals - sometimes including the transfer of severely exposed patients to Collaborating Centres for specialist medical care - and to assist in the development of measures necessary to limit health effects.

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 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;
- assist in the development of procedures to strengthen the countries' abilities to manage such accidents for themselves.

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.

A typical situation may be illustrated by the following case:

In a developing country a gammagraphy source fell off its holder. It was collected by a worker, then placed in the family bedroom where it remained for several weeks, irradiating the whole family. After having investigated the origin of the death of some family members, the local authorities took charge of the remaining members, some of whom had been severely irradiated, and evacuated the house where the source was still in place.

In the meantime, the medical authorities, after informing their government, called a WHO Collaborating Centre for help. In spite of the fact that it was a public holiday, the Collaborating Centre answered immediately and sent two physicians to the locality.

Action was taken to neutralize the source and take care of the patients. The source was put in a lead container by the two physicians within a few hours after the call. The transportation of two patients was then organized from the local hospital to the clinical institution of the Collaborating Centre.

2. Involvement of national institutions in the network

At the present time there are three WHO Collaborating Centres designed for radiation emergency medical preparedness and assistance (France, USA and USSR). In order to create the network, the number of Collaborating Centres should be expanded. This number should be optimal to provide, on the one hand sufficient geographical coverage, and on the other to ensure close and efficient cooperation between WHO and its Collaborating Centres. It seems that the optimal number lies between 7 and 10. 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. A 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.

3. Strengthening the capabilities of the Collaborating Centres

Wide-spread exchange of information should be arranged, including accident reports, therapy experiences, meeting schedules, annual reports, training course schedules, scientific papers accepted for publication and newsletters.

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.

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

Recommendations

- 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.

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

A major role for the network 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 network 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 an 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;

- consider their role and constraints 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.

5. 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.

ANNEX V

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March -2 April 1987)

Description of existing and prospective WHO Collaborating Centres for radiation emergency medical preparedness and assistance

1.1 ICCR - International Collaborating Centre in Radiopathology (Fontenay-aux-Roses, France, President - Dr H. Jammet)

The ICCR is an association based on 3 bodies: the Curie Institute (CI) which is an independent organization, the Commissariat on Atomic Energy of France (CEA) and the Central Service for Protection against Ionizing Radiation (SCPRI). The ICCR was designated in 1980.

The main objectives of the ICCR are to provide Member States with recommendations and practical assistance on the medical handling of radiation emergencies and to strengthen their medical preparedness to radiation accidents.

In practical terms, the CI, located in Paris, is a clinical base of ICCR, in particular for the treatment of overexposed persons.

The Institute for Radioprotection and Nuclear Safety (IPSN) which belongs to CEA, is a research base of ICCR. Experiments on radiation effects in animals, developments in methods of diagnosis of radiation injuries, dosimetric measurements for reconstruction of radiation accidents and other research activities are carried out at this Institute. The IPSN is partly located at Fontenay-aux-Roses (Centre of Nuclear Research, CNR).

The SCPRI contributes with its expertise in the field of radiation protection and provides its facilities for measurements of radioactive contamination including internal contamination in humans.

Duties of these institutions in the case of a serious radiation accident are the following:

Actual or suspected victims of the accident are taken to SCPRI which would serve as a centre of initial reception. Some of the persons examined at SCPRI may be transferred to either Fontenay-aux-Roses (CNR) for diagnosis or to Paris (CI) for treatment.

The ICCR is on alert around the clock to provide assistance in the case of a radiation accident not only in France but in any foreign country which might appeal for help. Countries belonging to European, East Mediterranean and African regions are particularly taken under the umbrella of the ICCR services.

Experts of the ICCR actively participate in the UNSCEAR, ICRP and in elaboration of international recommendations on the medical handling of overexposed persons.

The ICCR provided medical aid to victims of radiation accidents including those in developing countries. It published in English and French 3 booklets describing its services and research activities, recommendations on planning nuclear accidents and guidance on the medical handling of irradiated persons. The booklets were sent to WHO/HQ to be distributed upon request. The ICCR contributed a lot to organizing and convening Training Courses on Radiation Accidents for European countries (Budapest, 1985).

The ICCR terms of reference are the following:

- serve as a focal point for advice and possible medical care in cases of radiation injuries in humans.
- facilitate the progressive development of a network of equipment and specialized staff in human radiopathology;
- assist in the elaboration of medical emergency plans for major nuclear accidents;
- initiate and carry out coordinated studies on human radiopathology and epidemiological studies that may be appropriate;
- assist in the preparation of relevant documents and guidelines.

In the case of an actual radiation accident the ICCR could provide the following services:

- a team for on-site urgent treatment;
- a team with appropriate equipment for rapid surveys of external radiation and/or contamination;
- transportation of patients;
- facilities for medical examination and treatment including:
  a) bioassay service,
  b) whole-body counters,
  c) radiochemical analysis of samples,
  d) specialized staff and hospital facilities for treatment of radiation injuries;
- follow-up medical supervision and treatment.

1.2 CREA - Collaborating Center for Radiation Emergency Assistance (Oak Ridge, USA, Program Director - Dr R.C. Ricks; Director Radiopathology - Dr C.C. Lushbaugh; Accident Registry - Dr S.A. Fry)

The CREA designated in 1980 is part of the Radiation Emergency Assistance Center/Training Site (REAC/TS), of Oak Ridge Associated Universities, Medical and Health Science Division. The REACT/TS programme is operated for the U.S. Department of Energy (DOE).

The primary REAC/TS mission is to maintain a 24-hour capability for response to radiation accidents. A radiological emergency response team is on 24-hour call for this purpose. REAC/TS response capabilities also include consultative assistance. In addition, the REAC/TS facility serves as a central training and demonstration unit where U.S. and foreign medical, paramedical support, and health physics personnel receive intense training in medical management for radiation accidents. Courses are regularly scheduled and conducted. Another component of REAC/TS is an Accident Registry system which includes not only cases of overexposure in the USA but also foreign cases.

The CREA serves as a focal point in the Americas region for advice and actual medical assistance in cases of radiation overexposure. It contributes to strengthening medical preparedness of American countries for radiation accidents by training activities, convening meetings, assisting in elaboration of national plans for emergency actions etc.

The CREA has responded to several radiation accidents in countries of the region. On-site teams investigated the accidents. Exposed persons were subjected to medical investigation.

REAC/TS issues quarterly newsletters which contain information relevant also to the activities of the CREA. Experts of the CREA actively participate in the UNSCEAR and in elaboration of international recommendations on the medical handling of overexposed persons in cooperation with WHO and IAEA.

The CCREA terms of reference are the following:

- serve as a focal point for advice and possible medical care in cases of human radiation injuries;
- facilitate the progressive establishment of a network of equipment and specialized staff in human radiopathology;
- assist in the establishment of medical emergency plans in the event of large-scale radiation accidents;

- develop and carry out coordinated studies on human radiopathology and epidemiological studies that may be appropriate;
- assist in the preparation of relevant documents and guidelines.

In the case of an actual radiation accident, the CCREA might provide:

a) a survey team for rapid external radiation and/or contamination surveys with appropriate equipment;
b) a team for on-site emergency treatment;
c) transportation of patients;
d) facilities for medical investigation and treatment including:
   (i) bioassay services,
   (ii) whole-body monitors,
   (iii) radiochemical analysis of samples,
   (iv) specialized staff and hospital facilities for treatment of radiation injury;
e) follow-up medical supervision and treatment.

1.3 CCMRP - Collaborating Centre for Medical Radiation Pathology (Leningrad, USSR, Head - Dr A. E. Zherbin)

The CCMRP designated in 1986 is based upon the Central Research Institute for Roentgenology and Radiology, USSR, Ministry of Health.

The main objectives of the CCMRP are to provide Member States with recommendations on the medical handling of radiation emergencies and to strengthen their medical preparedness to radiation accidents. In the case of a radiation accident the CCMRP can provide medical assistance to some Member States upon their request.

Particular activities of the CCMRP are concentrated on the development of quantitative approaches in diagnosis, prognosis and treatment of radiation injuries.

The CCRMP terms of reference are the following:

In General

- serve as a focal point for advice and medical care in cases of radiation emergencies;
- assist in elaborating plans of medical preparedness to radiation emergencies;
- participate in coordinated studies on human radiopathology and radiation epidemiology;
- support WHO activities in the training of medical personnel for the medical handling of radiation emergencies;
- take part in international meetings, especially organized by WHO on the problems of overexposure and to contribute to producing guidelines in this area;
- collect and evaluate worldwide information on diagnosis and treatment of radiation injuries;
- exchange experience and information as well as to coordinate its activities with other WHO Collaborating Centres in the medical handling of radiation emergencies.

In Particular

Develop quantitative techniques for:

- the most plausible and quick prognosis of radiation injuries;
- assessment of effectivensss of diagnostic and therapeutic measures;
- simulation and interpretation of radiation-induced processes;
- evaluation of public health actions for protection of the population in the case of radiation accidents.

In the case of radiation accidents

To provide, if agreed in advance by bilateral regulations:

- an on-site emergency team
- admission of foreign patients for medical investigation and treatment
- follow-up medical supervision and treatment

2. Prospective Centres

2.1 Argentina

Argentina develops a national programme for preparedness and response to radiological accidents.

In 1984 a system was established to handle persons involved in radiation accidents in Argentina in accordance with an agreement between three institutions:

a) National Atomic Energy Commission (CNEA)
b) Ministry of Public Health (Ministerio de Salud)
c) Municipality of the City of Buenos Aires (MCBA)

Each of these institutions has different responsibilities:

A. National Atomic Energy Commission (CNEA) is responsible for:

a) Reconstruction of the radiation accident;
b) Training special personnel in decontamination techniques;
c) Biological dosimetry;
d) Laboratories and instrumentation.

B. Ministry of Public Health (Ministerio de Salud)

a) Provides the hospital facilities;
b) Bears general responsibilities for medical preparedness to radiation accidents.

C. Municipality of the City of Buenos Aires (MCBA)

a) Coordinates communication and transportation problems.

Under the agreement a special committee was created called "Coordination Committee" (Comite Coordinador) which is responsible for:

a) organization and response in the case of radiation accidents;
b) emergency planning for radiation accidents;
c) establishing points of contact and hospital facilities.

Three persons were nominated officially to be contacted in the case of an emergency:

National Atomic Energy Commission - Dr J.C. Gimenez
Municipality of Buenos Aires - Dr A. Rozados
Ministry of Health - Eng. J. Skvarca

For quick contact and correspondence the best person is:
Skvarca, J.
Tel: 01-620-1759 - Buenos Aires - Argentina
Address: P.O. Box 3268 - Buenos Aires (1000).

The Argentine authorities support the idea to designate a WHO Collaborating Centre in Argentina for participation in the WHO network on radiation emergency medical preparedness and assistance.

2.2 Australia

In this country the Australian Radiation Laboratory (ARL) was designated as a Collaborating Centre for Radiation Protection (CRP) in 1985. It is a national laboratory, operated by the Department of Health (Federal), and maintains oversight over occupational and public health aspects of ionising and non-ionising radiation. It assists the Australian States, who have constitutional responsibilities for health matters, by providing advice, guidance and scientific support to State Health authorities. ARL participates actively in the global environmental monitoring programme, coordinated by the IRCR.

It would be appropriate to expand the terms of reference of ARL and to designate it jointly with the Peter MacCallum Hospital as a Collaborating Centre for Radiation Protection and Medical Radiation Emergency Preparedness and Assistance. The Peter MacCullum Hospital is Australia's foremost centre for cancer therapy, and a teaching hospital of Melbourne University. It already serves as emergency reference point for the State of Victoria. Suggested added terms of reference are:

- to help Member States in elaborating their plans for medical preparedness;
- to promote training of personnel in developing countries in medical prepareness and first aid;
- to define optional methods for diagnosis and treatment for overexposure;
- to provide medical assistance to exposed persons, both on site and in specialised clinics (device to be provided by the Peter MacCallum Hospital) subject to bilateral agreement between Australia and the country(s) involved.

Point of contact: Director, Dr K. H. Lokan
Australian Radiation Laboratory
Lower Plenty Road
Yallambie, Victoria 3085
Australia

Tel: (03) 433 2211
Telex: AA 31726
Facsimile: (03) 434 5654
After hours phone: (03) 435 3916 (Dr K. Lokan)

A potential liaison institution is:

National Radiation Laboratory (Department of Health)
New Zealand

Equivalent institutions may exist in the following nearby countries:

Indonesia
Malaysia
Papua New Guinea
Singapore
Thailand
Fiji, Vanuatu and other Pacific Island States.

2.3 Brazil

In the last 10 years Brazil has diversified its activities in the field of peaceful uses of nuclear energy. The use of radiation in industry, agriculture, medicine is widespread and about 90,000 workers are associated with such activities. The fuel cycle activities brought in an additional risk of radiological accidents. At present there are 1746 hospitals, industries, research institutes and private companies registered at CNEN as users of ionizing radiation.

The possibility of organizing a WHO Collaborating Centre in Brazil will permit the materialization of the interest of national organizations for international collaboration programmes.

A WHO Centre in Brazil would act as a focal point for advice on radiation protection under normal and accidental conditions and medical preparedness in the case of overexposure to radiation and/or to radioactive contaminants.

A WHO Collaborating Centre in Brazil could be based upon:

- Institute of Radioprotection and Dosimetry (Instituto de Radioproteção e Dosimetria) of the Brazilian Nuclear Energy Commission (CNEN)
- National Cancer Institute, Ministry of Health
- Marcilio Dias Naval Hospital, Ministry of Navy
- FURNAS - Health Division, Ministry of Mines and Energy
- NUCLEBRAS - Health Division, Ministry of Mines and Energy

Tentative terms of reference of the prospective Centre are:

To collaborate with WHO in the field of medical preparedness for radiation accidents and in other aspects of radiation protection, and especially:

- to serve as a focal point in Brazil for advice on radiation protection under normal conditions and on remedy actions in the case of overexposure and radioactive contamination;
- to take part in coordinated WHO programmes on general aspects of radiation protection, monitoring of radioactivity and medical preparedness to radiation accidents;
- to promote the progressive establishment of equipment and techniques and the training of personnel;
- to participate in the preparation of relevant national and WHO documents and guidelines;
- to exchange with WHO information on developments in radiation protection;
- to assist in the elaboration of radiation emergency plans;
- in the case of a radiation accident, to take necessary measures to mitigate the consequences of the accident and to cooperate, if necessary, with other WHO Collaborating Centres.

The activities planned for the Centre in the event of accidental overexposure and/or contamination would be dose assessment, medical evaluation, medical treatment and assessment of long-terms effects.

The activities related to dose assessment will be centred at IRD with its Accidental Exposure Analysis Group. The estimated dose and related information will be passed to the Medical Evaluation Group with participation of NUCLEBRAS, FURNAS and IED Medical staff. If necessary, specialists from complementary areas will be requested as consultants. This Evaluation Group will recommend medical actions and the most appropriate facility for treatment. The Centre for treatment will be the Marcilio Dias Naval Hospital as well as the National Cancer Institute where a Bone Marrow Transplant facility is presently operational. The long-term assessment will be carried out by IRD which will maintain a record of events and follow-up actions.

ANNEX VI

COORDINATION MEETING OF EXISTING AND PROSPECTIVE WHO COLLABORATING CENTRES ON RADIATION EMERGENCY MEDICAL PREPAREDNESS AND ASSISTANCE

(30 March - 2 April 1987)

Coordinated plan of action for establishing the network

Provide information and reports, to be circulated by WHO (applies to existing Collaborating Centres) (summary plus attachments, describing activities, formal institute reports)	15 June 1987
Establishment of extended network by	
- expanding the terms of reference of the Australian Collaborating Centre for Radiation Protection	1 July 1987
- inviting Argentina and Brazil to participate by designating appropriate Collaborating Centres within their countries	15 July 1987
- consider the addition of other Member States to achieve an adequate world-wide cover	1 August 1987
Provide lists from existing and proposed Collaborating Centres of regional liaison institutes in nearby countries, and of support institutions	1 July 1987
Provide outline of regional plans (workshops, general support)	1 October 1987
Provide, for prompt circulation by WHO, existing contingency plans, accident reports, case histories (mostly from existing Collaborating Centres)	30 September 1987
Develop a bibliography of literature on accident management, care of irradiated patients	for completion by 1990
Future coordination meetings:	
in conjunction with Oak Ridge Symposium on Medical Management, Oak Ridge	first half of 1988
Leningrad Collaborating Centre	second quarter of 1989
Investigate exchange of staff between Collaborating Centres, taking advantage of existing government-to-government scientific exchange programmes	June 1988
First Regional Training Workshops to commence	1990
Review existing WHO publication lists relating to radiation accidents. Suggest titles needing revision. Make recommendations on priorities and urgency for WHO funding action. Indicate appropriate authors, drawn from Collaborating Centres where appropriate, but to be funded in normal way by WHO	next meeting
Provide list to Secretariat of field missions, planned or undertaken under WHO/Collaborating Centre auspices, during next year	next meeting

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