STATEMENT FROM THE 1985 PARIS MEETING OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

The International Commission on Radiological Protection (ICRP) met in Paris in March 1985. The Commission reviewed the work of its committees and task groups, and approved for future publication a report on the quantitative bases for developing a unified index of harm.

The Commission identified four topics requiring comment:

Dose Limits for Members of the Public

In the recommendation on effective dose-equivalent limits* for members of the public, made in its 1977 Recommendations (*ICRP Publication 26*[1]), two values were mentioned. The use of the limit of 5 mSv in a year was endorsed, but only under the conditions described in paragraphs 120 to 128 of *ICRP Publication 26*. For other circumstances the Commission recommended that it would be prudent to limit exposures on the basis of a lifetime average annual dose of 1 mSv.

The Commission's present view is that the principal limit is 1 mSv in a year. However, it is permissible to use a subsidiary dose limit of 5 mSv in a year for some years, provided that the average annual effective dose equivalent over a lifetime does not exceed the principal limit of 1 mSv in a year.

With this limitation on the effective dose equivalent, the non-stochastic organ dose limit of 50 mSv in a year becomes unnecessary for most organs.[2] However, since the dose equivalents in the skin and the lens of the eye are not included in the computation of effective dose equivalent for the individual,[3] organ dose limits are still needed for these two tissues. The recommended dose-equivalent limit for both the skin and the lens is still 50 mSv in a year for members of the public.

The Value of the Quality Factor in the Case of Neutrons

The information now available on the relative biological effectiveness (RBE) for neutrons for a variety of cellular effects *in vitro*, and for life-shortening in the mouse, is being reviewed by the Commission. The implications of this information will be considered as part of a larger review of recommendations to be undertaken by the Commission over the next four years or so. Meanwhile, in the case of neutrons the Commission recommends an increase in Q by a factor of 2. The permitted approximation for $\bar{Q}$ for fast neutrons thus changes from 10 to 20.

These changes relate only to neutrons, and no other changes in Q are recommended at this time.

Potentially Dangerous Radiological Practices

The Commission has been informed by its Committee on Protection in Medicine of some potentially dangerous practices in the use of fluoroscopic apparatus. Adherence to the

* The Commission's dose-equivalent limits apply to the sum of the effective dose equivalent resulting from external exposure during 1 year and the committed effective dose equivalent incurred from that year's intake of radionuclides.

recommendations and guidance given in the Commission's report Protection against Ionizing Radiation from External Sources Used in Medicine[4] could prevent such situations. Specifically, the Commission is concerned about the introduction of fluoroscopic apparatus with over-couch tubes which can give substantial x-ray exposures to operators if they are not protected by shields. With the operator wearing a protective apron and standing beside the patient, the dose from an over-couch screening set, compared with that from an under-couch set, can be 250 times higher to the hands, 100 times higher to the eyes and 35 times higher to the whole body. For an operator with a heavy work load the dose to the lens of the eye can greatly exceed the Commission's recommended occupational limit of 150 mSv (15 rem) in a year, and, if continued, could lead to permanent damage.

Other examples of practices causing concern, which have been reported to the Commission, include complex radiological procedures undertaken by physicians or surgeons without training in radiology and radiation protection. The operators may feel that the obvious needs of the patient outweigh a future risk of radiation injury to themselves. Occasionally this has even led to the removal of individual monitoring devices to avoid identification of high dose levels.

These problems are compounded by the routine use of unnecessarily high fluoroscopic currents and unnecessarily long fluoroscopic times. The Commission believes that the use of appropriate protective shielding and careful attention to technique, including the use of video storage devices, could result in a substantial decrease in radiation doses to operators. Insistence on suitable training in radiation hazards, and detailed monitoring of doses to eyes and extremities, may be particularly helpful in reducing significantly these potentially dangerous doses to operators.

Reduced Doses to Patients

In its publication Protection of the Patient in Diagnostic Radiology[5] the Commission recommended several changes of equipment and technique that would reduce the dose to patients at a very moderate cost. It now appears that these changes are not being introduced as rapidly as the Commission had hoped. The Commission therefore wishes to emphasise to manufacturers and radiological practitioners that these changes are effective and can be introduced at a cost that is much more than offset by the value of the reduction in detriment that they achieve.

In particular, the Commission recommends the wider use of rare-earth screens, and the selection of materials with very low attenuation (such as those made of carbon fibre) for cassette faces, table tops and the non-opaque parts of grids.

References

1. ICRP Publication 26, *Annals of the ICRP* **1** (3), 1977.
2. Statement from the 1983 Washington meeting of the Commission. *Annals of the ICRP* **14** (1), 1984.
3. Statement from the 1984 Stockholm meeting of the Commission. *Annals of the ICRP* **14** (2), 1984.
4. ICRP Publication 33. *Annals of the ICRP* **9** (1), 1982.
5. ICRP Publication 34. *Annals of the ICRP* **9** (2/3), 1982.