

ICRP ACTIVITIES IN MEDICINE - THE DEVELOPMENT OF COMPREHENSIVE
GUIDES TO GOOD PRACTICE

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The special relationship between the practice of medical radiology and the ICRP is no accident. The International Commission on Radiological Protection was established in 1928 under the name "International X-Ray and Radiation Protection Committee" by the Second International Congress of Radiology Meeting in Stockholm. It assumed its present name and organisational form in 1950 in order to cover more efficiently the expanding field of radiation protection. In its most recent recommendations, contained in Publication 26 (1977) a new system of dose limitation was elaborated, based on three interlocking elements. The Justification, Optimisation and Dose Limits interact to keep radiation doses to both occupationally exposed persons and to the general public "As Low As Reasonably Achievable, economic and social considerations being taken into account". Although medical uses of ionising radiation were excepted from dose limits because it was felt that the degree of safety achieved was now so high than an X-ray examination, recommended on the basis of qualified clinical judgement, generally brought a benefit to the patient which entirely outweighed the unavoidable radiation risk, the Commission felt that it would be helpful to disseminate in a more digestible form the specific application of its recommendations to modern medical practice.

In 1981 Committee 3, formerly the Committee on External Radiation, became a Committee on Radiation Protection in Medicine and in its new guise became more widely representative of practicing radiologists, nuclear medicine physicians and radiation oncologists. As a result of its activities, a series of ICRP publications have now appeared on protection of the patient - in Diagnostic Radiology (Publication 34), in Radiation Therapy (Publication 44) and in Nuclear Medicine (in Press). Unlike other

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ICRP publications, these are an attempt to provide readable but reasonably comprehensive guides to good practice, and are targetted at the practising radiologist and clinician and not at National Authorities.

Diagnostic X-ray procedures are the cause of the majority of man's exposure to ionising radiations from artificial sources. The Commission identified the need for all radiological examinations to be justified. On the principle that all radiation doses should be kept "As Low As Reasonably Achievable", the Commission has developed principles which allow the assessment of how far it is reasonable to go in cost and efforts to reduce radiation exposure. These methods apply to protection of the patient in diagnostic radiology no less than in any other planned exposure of man to radiation. The limitation of risk to the individual patient is usually implicit in the medical decision that a particular examination is in the interest of the patient. The optimum use of equipment and techniques then make any explicit limits of radiation dose for diagnostic radiology inapplicable. If each individual examination is properly justified, the collective risk is by necessity also justified. There is thus no reason to limit the total collective radiation dose from medical exposures below any value that would simply be the sum of the individual doses from appropriately performed examinations. However, it is still necessary to assess the collective doses from various medical procedures since this gives a useful indication of where protective measures related to design or choice of procedure might have a large impact in reducing overall population radiation exposure. Publication 34 outlines the background to the protection of the patient in diagnostic radiology, from clinical judgement through education and manpower requirements to the technical and physical factors, and gives a detailed method for the determination of organ doses from diagnostic X-ray examinations which can be used as a basis for optimisation of individual and collective doses.

For radiation therapy, the problem is more complex. Protection of the patient in radiation therapy requires, uniquely, not the avoidance of radiation exposure or even the avoidance of risk of severe damage to some tissues. Rather, once the choice is made that radiation is the appropriate treatment, it involves achieving

the optimal balance between the efficacy of irradiation in achieving sterilisation of the malignant growth and the production of the minimum treatment-related complications. This latter involves making unwanted radiation doses As Low As Reasonably Achievable. The process of protecting the patient requires optimisation of the treatment as a whole, optimisation of protection alone is not enough. This is detailed in Publication 44 which is not designed to be a text book of radiation therapy. Rather, it presents a broad picture which is readable by all involved in the care of cancer patients. This includes physicians, such as medical oncologists who will not themselves use radiation therapy but who need to know about its potential benefits and risks. It includes also the members of the radiation therapy "team"; medical physicists, radiographers, dosimetrists and also the administrators who need to understand the requirements of their clinical specialist colleagues. The Publication covers general principles of radiation therapy, the specific problems of external beam and brachytherapy, gives a guide to expected risk to specific organs/tissues from non-stochastic radiation injury, as well as discussing carcinogenesis, and gives guidance on doses to organs and tissues outside with the useful treatment beam for radiation field arrangements used to treat some of the most common tumours.

Once again in clinical nuclear medicine the problem is different in that although the technique can give unique information about the function of organs, the body tissue most heavily exposed to radiation is often not the organ being studied and is more likely to be in the path of either intake or removal of the specific radioactive tracer material from the body. Reduction of the dose may be associated with a loss of diagnostic information, and an optimisation procedure is required to maximise the amount of clinically relevant information obtained from each examination. Because radioactive material is administered to the patient, the patient represents a hazard to other members of the public, and both the design of clinical facilities and the organisation of departmental work should be tailored to minimise its potential hazard. This is discussed in detail in the publication.

In all these ICRP publications it is stressed that the establishment of measures for patient protection are not intended to impede the continued development of the clinical uses of radiation, both diagnostic and therapeutic. It is expected that such measures will actually contribute to higher standards of clinical practice, yet, it is made clear that where there are limitations on resource, both material and personnel, so that the ICRP recommendation cannot yet be met, patients should not be denied the necessary diagnostic examinations or radiation treatment.

For the future, Committee 3 is drafting a further simplified version of the Publication on Protection of the Patient in Diagnostic Radiology aimed specifically at non-radiologist clinicians, radiologists and radiographers, and it is hoped that both it and a single composite volume containing the three existing "Guides to Good Practice" on protection of the patient in diagnostic radiology, radiation therapy and nuclear medicine will be available to participants at the next International Congress of Radiology to be held in Paris in 1989.

References: International Commission on Radiological Protection
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