

The Use of Effective Dose

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Effective dose was introduced in the International Commission on Radiological Protection (ICRP) 1977 Recommendations, at which time the overriding concern was the control of occupational exposures. As a whole body dose, it provided the necessary metric for the practical implementation of the principles of optimisation and limitation. It presents an elegant solution to the requirement for a single quantity that enables the summation of all radiation exposures, including both external and internal exposures. The concept underlying effective dose has remained essentially unchanged since the 1990 Recommendations until the 2007 Recommendations. However, application of effective dose has been extended to protection of members of the public of all ages, including in utero exposures of the embryo and fetus. Particularly problematic is the use of effective dose in the assessment of medical exposures of patient populations of different ages and where the requirement is for a measure of risk to individuals. While doses may be calculated with reasonable reliability down to low levels, the associated risks implied by the linear-no-threshold dose-response model are uncertain. ICRP will publish advice on the use of effective dose for all situations of exposure, addressing issues including control of in utero exposures and risk estimation in medical applications.