used for myocardial perfusion studies? My initial reaction to these types of questions is to whip out my MIRD pamphlets and make some calculations. NCRP Report No. 83 reminds us that there are three fundamental ways to answer those questions: (1) measure the desired doses directly in humans; (2) extrapolate from animal or phantom data; and (3) calculate using a mathematical model. The Report then discusses the advantages and shortcomings of each of these, concluding that calculational methods will continue to be more workable than the others. Mathematical models are expected to become more and more realistic as computing power increases and computing costs and time decrease. However, a mathematical model will never be an exact description of any given individual, and any assumed "Reference Man" biokinetics data will similarly not be an exact description of that individual. Thus, calculational methods will get better for a "representative" person, but we should never expect them to be exact for you or me as individuals, especially in the presence of altered physiology due to disease.

NCRP Reports 83 and 84, taken with Reports 70 and 73, constitute current NCRP thinking about radiation dosimetry in nuclear medicine. Report No. 83 will be of interest primarily to researchers working on internal dosimetry calculations and measurements. Health physicists and medical physicists who teach internal dosimetry may find it useful as a conceptual base for modern internal dosimetry techniques. Clinicians and technologists are not likely to find it of much value to them.

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NCRP REPORT No. 84, GENERAL CONCEPTS FOR THE DOSIMETRY OF INTERNALLY DEPOSITED RADIONUCLIDES.
National Council on Radiation Protection and Measurements, Bethesda, NCRP Publications, 1985, 109 pp, $12.00

Current USNRC regulations regarding internally deposited radionuclides are based on NCRP Report No. 22, "Maximum Permissible Body Burden and Maximum Permissible Concentrations of Radionuclides in Air and Water for Occupational Exposure," published in 1959. In recognition of many of the conceptual advantages of the most recent guidance of ICRP Publications 26 and 30, both EPA and NRC have announced plans to adopt the ICRP formulations in preference to the older NCRP scheme. the ICRP formulation is different from the NCRP approach in many philosophical as well as technical ways. It is understandable, therefore, that there has been a vigorous debate within the health physics and nuclear medicine communities in regard to the advisability of adopting the ICRP scheme in toto or only in part. NCRP Report No. 84 presents NCRP evaluations of ICRP methods and recommendations and expresses reservations about their use for radiation protection policy-making and for evaluation of exposures to individuals.

Chapters 1 and 2 describe current NCRP work related to this Report and the scope of the Report. Chapter 3 discusses the major concepts of ICRP Publication 26 *vis à vis* NCRP Report 22 and, in general, concludes that the ICRP Publication 26 scheme is an improvement. The ICRU Report 33 definition of dose equivalent, which had been tacitly adopted in a slightly different format in NCRP Report 39, was formally adopted, and the position is taken that "hot spot" distributions of radioactive material in an organ should nevertheless be treated as a uniform distribution for calculation of organ doses. The specific effective energy methodology for calculating organ doses was adopted; this is essentially the same as the MIRD method with changes in nomenclature. MPC's were based on continuous intake throughout the year, while annual limits to intake (ALI's) are based on a single intake per year. The calculational differences are minimal and have virtually no effect on long-term doses, although short-term doses may be significantly different. The committed dose equivalent is the integrated dose equivalent to an organ during the 50 years following intake. While agreeing that there are some valuable uses of the committed dose equivalent for planning purposes and for evaluating compliance, NCRP cautions against its blind use for calculating doses in individuals since actual organ dose equivalents will be of greater concern. NCRP prefers the concept of effective dose equivalent over the use of a critical organ in developing radiation protection standards, but it endorses the continued implicit use of the critical organ concept to derive maximum doses for organs having low susceptibility to stochastic effects.

Derived limits are discussed in Chapter 4. The annual limit on intake (ALI) is considered to be valid and to be useful for calculation of derived air concentration (DAC), but the ALI is deemed to be difficult to use in practice. The DAC concept is approved unconditionally. NCRP feels that derived organ and body burdens are necessary for the operational health physicist and expressed its dismay that ICRP did not present them; future NCRP reports will remedy this shortcoming.

Chapter 5 deals briefly with the mathematical models used by ICRP. Chapter 6 sets forth research needs that NCRP identified during preparation of the report, and Chapter 7 is entitled "Summary Statement of NCRP Position on Control of Internal Dose (with special reference to ICRP Publications 26 and 30)." Various appendices treat in more detail the mathematical models used in ICRP Publications 26 and 30.

NCRP Report No. 84 is a philosophical document which will be of value to those of us who are struggling with the proposed revision to 10CFR20, which is the regulatory embodiment of the new ICRP scheme. It is not a practical guide to the scheme, nor does it attempt to explain the scheme in detail. This Report belongs to the bookshelf of all health physicists and any nuclear medicine personnel concerned with the theoretical underpinnings of our national radiation protection policy.

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Books Received

Brigham and Women's Hospital Handbook of Diagnostic Imaging. *B.J. McNeil, H.I. Abrams, Eds. Boston, Little, Brown, and Co., 1985, 450 pp, $18.00*