

IRPA 10

TOPICAL SESSIONS Reports of Co-Chairmen for Highlight Sessions

T-3: New Models for Internal Dosimetry

Monday, 15 May 2000

Chair and Keynote: J. Stather

Co-Chair: K. Hendrichs

The session addressed all topics relevant for the dosimetry of incorporated radionuclides: modelling, measurements of biokinetic parameters, monitoring procedures and risk assessment.

J. Stather (UK) gave in his key note presentation "Development of Models for Internal Dosimetry" an overview describing the present situation and the future developments. He stated, that during the last decade there was a considerable improvement of the scientific basis for modelling. In the opinion of the rapporteur the most important aspect is the development towards physiologically based models. This does not only allow more reliable extrapolations in cases characterized by a lack of data; it also contributes to a higher acceptance of the models which may improve litigation situations. In the near future we can expect the publication of dose coefficients for the embryo/fetus, an improved model for the alimentary tract and practical guidance for the application of the respiratory tract model. In longer terms ICRP will focus on higher compliance of dosimetric models and bioassay interpretation. Additionally it is recognized as important to identify the sensitive tissues in skeleton and respiratory tract.

A. Giussani (Italy) described in his presentation "Stable Isotopes as Tracers for Radionuclides" a innovative way to improved biokinetic data. The advantage of his technique is that data can be derived from observations with humans without radiation exposure and with sufficiently low detection limits. The small masses administered are assumed not to influence the uptakes from the GI-tract. The measurements give retention functions for the whole body and the blood as well as excretion rates in the urine. Results are available for the elements Mo, Te, Ru, and Zr showing important deviations of the observations from the standard models and considerable influences of nutrition.

Molokanov (Russia) discussed ("Parameter Uncertainty Analysis in the Task of Internal Dose Reconstruction Based on Am Organ Activity Measurements") the applicability of in-vivo monitoring of incorporated Americium for quantifying Plutonium intakes. Under the assumption, that Am is a good tracer for Pu, his analysis of uncertainties for this procedure indicates a considerably higher reliability than for the in-vitro analysis of Pu-excretions.

Lee (Korea) gave a lecture ("Plutonium Fecal and Urinary Excretion Function") on the derivation of excretion functions for Pu. His calculations were mainly based on

the assumption, that the fecal excretion rate is exclusively determined by systemic Pu, and that the clearance from the respiratory tract may be neglected.

Guilmette (USA) announced a promising project on the basis of numerous tissue samples from former Mayak workers ("Improved Dosimetry and Risk Assessment for Plutonium-Induced Lung Disease Using a Microdosimetric Approach"). The microdosimetry is expected to reveal important influences of inhomogeneous distributions and of smoking habits, thus this