INTERNAL DOSIMETRY
ITS EVOLUTION AND NEW TRENDS

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Introduction

Inhalation and ingestion are the major routes of intakes of radionuclides into the body, however other kinds of contamination can also occur. As an example wounds in the skin can also provoke the transport of radionuclides to the bloodstream. The big question on internal dosimetry remains in the way to evaluate such intakes as well as in the establishment of safe limits for intakes of radionuclides by workers and members of public.

The International Commission on Radiological Protection (ICRP) has been dealing with these problems for about forty years [ICRP59]. The intake and the internal doses can be quantitatively assessed through mathematical modeling especially made to simulate the human metabolism associated with in vivo and in vitro bioassay methods. These models are constantly being updated in order to permit good estimates of the intake, retention and excretion of radionuclides by the human body. Dosimetric procedures are also under frequent revision in order to establish derived limits to be used in the practice of control of workers and also to provide better interpretations of the results of measurements based on the modeling.

A general model has been developed by ICRP for purposes of estimating intakes, body or organ contents and/or excretion rates for most radionuclides by means of describing the distribution and retention of the radionuclide under consideration into the body. This model is formed by three main components: a respiratory tract model, a gastrointestinal (GI) tract model and "metabolic" or systemic models describing distribution and retention of radionuclides in organs as shown in Figure 1. The ^{238}U isotope is employed in most of the examples of this text to illustrate the evolution of the systemic models.

This text is concerned on some discussions on the developments and trends of metabolic models and dosimetry and their associated parameters, which have been adopted by ICRP to evaluate intakes of radionuclides.