

Comments regarding the document entitled « Draft report of High level and expert group on European low dose research” which has been made available on internet for consultation.

1- This is an interesting initiative which must be encouraged because many people are now then exposed to low doses of ionizing radiations during medical exposures. Medical exposure remains by far the largest man-made source of exposure to ionizing radiation of the population. Furthermore, international statistics (UNSCEAR) show that the average dose per patient is increasing significantly in all developed countries and will continue to grow for many reasons:

- diagnostic radiology and nuclear medicine are efficient method for the diagnosis of diseases. CT scanning which delivers the highest doses (roughly 20 mGy in the field of view) is more widely used. New CT applications such as coronaro-angiography, virtual colonoscopy... have replaced other methodologies;
- they also contribute to the definition of the therapeutic strategy and to the follow up of the efficacy of the treatments;
- with interventional radiology, diagnosis and complex treatments are carried out non invasively and progressively replace surgery;
- low doses are received at distance from tumours during radiation therapy.

Consequently, the issue of low doses during medical exposures should be highlighted in the document as a major concern.

2- A definition of low doses should be given for the following reasons:

- Low doses are usually defined as the doses below which no effects have been observed with epidemiologic studies, i.e., 50 mSv in children and 100 mSv in adults. Consequently it should be said that the risk of low doses of radiations is small before saying that much uncertainties remain about the health effects of these low doses;
- Furthermore, in experiments the protocols of delivery of these doses vary widely in the literature. For example, some authors consider that they are studying low doses because that is the level they use in one experiment but they cumulate experiments and “in fine” the total doses may not fit in the low dose range. Therefore, in order to obtain meaningful results, some methodologies should be defined and precise counselling should be given to the experimenters to respect the corresponding rules;
- indeed, the question of the dose rate should be addressed as well.

3- For internal exposure risk, the effective dose which is used to define the low dose range cannot be used anymore since the distribution of the radionuclides is heterogeneous. Consequently, the absorbed dose by an organ or the equivalent corresponding doses should be used. What is then the definition of a low dose ? This question should be addressed before the project starts.

4- It is clearly stated that research on the basic mechanisms of radiation effects need to be thoroughly investigated. I fully agree with this point of view. Much will be learned from a better understanding of the mechanisms of the effects of low doses of radiations. Thus, I do not understand the logic to highlight as an important issue the shape of dose response to cancer. Which dose ? the issue of microscopic dosimetry should then be addressed. And then we are far from the usual LNT which is based on the effective dose.

Michel Bourguignon, ASN