

Open Working Group Sessions

Risks associated to uses of Ionizing
radiation for Medical Applications,
Including Diagnosis and Therapy
procedures

Aim

- To identify the possible role of research on people exposed to diagnostic or therapeutic radiations for future research projects on radiation protection
 - of the population as a whole
 - of workers at specific work places

Topics discussed

- Diagnostic radiology cohort
- Radiotherapy cohorts
- Medical occupational cohorts
- Applicability of radiotherapy cohorts to low dose research
- Research for the purpose of radiation safety of patients ?
- Need for multidisciplinary approaches
- Quality of radiation (neutrons)

Background

- Increasing number of diagnostic protocols, using external radiation or radionuclide (radiography, CT, PET, SPECT)
- 1 Million long-term cancer survivors treated with radiotherapy
- Mean survivor time of long-term survivor is more 20 years

EURATOM projects

- Projects which related to this topic
 - Current projects which be completed within the next 6 months
 - RACE (cardiovascular risk in breast cancer patients)
 - CARDIORISK (Mechanism of radiation-cardiovascular disease)
 - NOTE (Non targeted effect)
 - ALLEGRO (Risk to normal tissue from radiotherapy)
 - Current projects which will start within the next 6 months
 - EPIRADBIO (epidemiological and radiobiological studies on mechanism of cancer risk)
 - EPICT (leukemia risk after pediatric CT)

Diagnostic radiation exposure

- Which population ?
 - Several potential cohorts were discussed, but only pediatric CT was found suitable. This is already covered by EPICT.
 - This includes a pilot study on radiobiological studies on indicators of individual susceptibility.
- Which endpoints (leukemia, brain tumor, breast cancer...) ?
 - There was support for longer term follow up, but depending on the result of the pilot study more radiobiological research should be integrated into the project.

Therapeutic radiation exposure

- There was agreement that long-term cancer survivors who receive radiotherapy are a very suitable population for research needed in MELODI
- This indicates that dose dependent changes of functions and structure of organs can be investigated over the low and the moderate dose range (<0.01Gy to 2-5 Gy).

Examples of possible studies

1. The risk of lung cancer from the prostate radiotherapy (6MV-14MV, IMRT, CRT, charged particles)
2. The risk of second primary malignancies after radiotherapy of childhood cancer
3. Microvascular change in heart after post-operative radiotherapy of breast cancer using different techniques

Need of mechanistic studies

- It is essential that in all of these studies a large radiobiological program is incorporated
- The aim is to identify the underlying mechanisms including in vivo and ex vivo and molecular radiobiology research
- Need strong interaction with other Open Working Groups, but no OWG dedicated to radiobiology of the non cancerous late effects from external exposure

Conclusions

Multidisciplinary effort

Epidemiologists

Physicists

Mathematicians

Biologists

Physiologists

Medical Physicians