



**International Commission  
on Radiological Protection**

## **Task Group 89: Occupational Radiological Protection in Brachytherapy**

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Brachytherapy procedures may account for an important share of occupational radiation exposure in medicine for some facilities. Additionally, staff in brachytherapy treatment facilities may receive high radiation doses if radiological protection tools are not used properly. The Commission has provided recommendations for radiological protection during brachytherapy in ICRP Publications 97 (ICRP, 2005a) and 98 (ICRP, 2005b), and for training in radiological protection associated with diagnostic and interventional procedures in ICRP Publication 113 (ICRP, 2009). This report is focused specifically on brachytherapy, and brings together information relevant to brachytherapy occupational safety from the Commission's published documents. The material and recommendations in the current document have been updated to reflect the most recent recommendations of the Commission

### **MAIN POINTS**

- The aim of radiological protection, in general, is to manage and control exposures to ionizing radiation so that deterministic effects or tissue reactions are prevented, and the risks of stochastic effects are reduced to the extent reasonably achievable, societal and economic factors considered.
- Specifically, the most relevant deterministic effects among professionals involved in interventions guided by radiological image include eye lens injuries and possible hair loss in extremities.
- To achieve these objectives, the Commission recommends three fundamental principles of radiological protection: justification of practices, optimization of protection, and dose limitation for individuals, in the context of this report, for professionals involved in brachytherapy.
- Proper use of personal monitoring badges is necessary in brachytherapy facilities in order to monitor and audit occupational radiation dose.
- Individuals who perform brachytherapy procedures should be familiar with methods to reduce radiation dose to patients and staff.
- It is essential that professionals wear dosimeters correctly. No dose to an individual can be reasonably estimated in highly variable radiation fields without having some type of individual monitoring during all times of exposure.
- A quality management plan is critical in establishing safe practice for brachytherapy procedures. A qualified medical physicist should be accessible to all staff and detail emergency response procedures, roles and responsibilities of staff,
  - and quality assurance requirements that are both consistent with good practice and with regulatory requirements.
- Hospital staff in charge of occupational protection need knowledge of general radiological protection, but also need to be familiar with the clinical practice, the interventional procedures and the x-ray equipment used in interventions guided by radiological imaging.
- As with all other medical exposures, protection in brachytherapy treatments, associated imaging examinations, CT examinations, and fluoroscopic procedures should be optimized and dose reduction techniques should be used whenever applicable.