Modelling of secondary cancer risks
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In developed countries, more than half of all cancer patients receive radiotherapy at some stage in the management of their disease. However, a radiation-induced secondary malignancy can be the price of success if the primary cancer is cured or at least controlled. Therefore, there is increasing concern regarding radiation-related second cancer risks in long-term radiotherapy survivors and a corresponding need to be able to predict cancer risks at high radiation doses. Of particular interest are second cancer risk estimates for new radiation treatment modalities such as intensity modulated radiotherapy, intensity modulated arc-therapy, proton and heavy ion radiotherapy. The long term risks from such modern radiotherapy treatment techniques have not yet been determined and are unlikely to become apparent for many years, due to the long latency time for solid tumor induction. Most information on the dose-response of radiation-induced cancer is derived from data on the A-bomb survivors who were exposed to gamma-rays and neutrons. Since, for radiation protection purposes, the dose span of main interest is between zero and one Gy, the analysis of the A-bomb survivors is usually focused on this range. With increasing cure rates, estimates of cancer risk for doses larger than one Gy are becoming more important for...