

practice, a very large number of particle "histories" have to be simulated to attain sufficient statistical accuracy, and various approximations (e. g. condensed history, variance reduction) have been introduced in the process of adaptation of MC codes to the special needs of treatment planning. Such codes have become known as V(oxel)MC and X(ray)VMC, M(acro)MC, S(uper)MC, MCPAT(ient...). These will be described in detail and performance characteristics as well as treatment planning examples given. While the general-purpose MC codes result in computing times per case of the order of several hours, the special treatment planning codes reduce this time to around an hour or even much less on modern workstations or Pentium-based PCs.

### 65. PHYSICAL AND CLINICAL DOSIMETRY BY MEANS OF MONTE CARLO USING A PROCESS DISTRIBUTION TOOL

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The choice of the most appropriate strategy in a Radiotherapy treatment is mainly based on the use of a planning system. With the introduction of new techniques (conformal and/or small fields, asymmetrical and non coplanar beams, true 3D calculations, IMRT) the trustworthiness of the algorithms is being questioned. An alternative verification procedure is every time more necessary to warranty a treatment delivery. The reliability of Monte Carlo is generally accepted. However, its clinical use has not been operative due to the high CPU times needed. During the last few years our objective has been focussed to reduce this time by means of new process distribution techniques. This drop has made it feasible, not only the physical dosimetry under special conditions, but also a numerous variety of clinical cases: photon and electron conformal fields, Radiosurgery and IMRT. The carried out procedure is presented. Furthermore, experimental dosimetry data as well as conventional TPS calculations are compared with Monte Carlo simulations.

### 66. LATE EFFECTS OF CNS PROPHY- LACTIC IRRADIATION IN CHILD- HOOD DUE TO LLA USING MAGNETIC RESONANCE SPECTRO- SKOPY. (PRELIMINARY REPORT)

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**Purpose:** The aim of this study was to evaluate changes in magnetic resonance imaging (MRI) and magnetic resonance spectroscopy (MRS) of the brain in survivors with Acute Lymphoblastic Leukemia to assess neurotoxicity follow profilactic brain irradiation.

**Methods:** Ten from 100 patients with LLA treated in Department of Pediatric Hematology from 1990 to 1995 and irradiated in Centre of Oncology were included in MRI and MRS studies. The study group included 6 male and 4 female. All patients had been irradiated for brain using fraction dose of 1,8 Gy up to total dose of 18 Gy and had received MTX based chemotherapy in doses depending on level of risk. Two of them were included in low risk and eight in intermediate risk.

**Results:** MRI of brain was abnormal in 5 cases. There were mild white matter changes. The changes were seen in H- MRS metabolite ratios. In one of these cases we observed a impair of verbal functions.

**Conclusions:** The MRS could be valuable method to access brain tissue metabolism after radiotherapy. That noninvasive method may be recommended for children with LLA to observe neurotoxicity of profilactic irradiation.

### 67. RADICAL RADIOTHERAPY OF MUSCLE-INVADING BLADDER CANCER (BC): A RETROSPECTIVE ANALYSIS OF 49 PATIENTS

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Growing interest in the use of combined modality approaches for bladder-sparing procedures force radiation oncologists to optimise methods of radical radiotherapy. Since