INTRODUCTION: IMRT is the best option to treat tumours that are very close to critical normal tissues. However, some risks have been reported with its use, specially in children. Because dose distribution is very heterogeneous within the target and the number of monitor units is frequently increased to deliver IMRT, some authors have suggested that the risk of second malignancy radiation-induced could be increased. In addition, in pediatric patients, the heterogeneity of dose can also induce more adverse developmental effects. The Centro Infantil Boldrini is the most important oncology children’s hospital in Brazil, treating ~ 500 new cases/year. The Radiotherapy Division began its activities in 2006 and almost 120 new cases/year have been irradiated in our unit since then.

PURPOSE: To describe the IMRT experience in a specialized pediatric radiotherapy center.

PATIENTS AND METHODS: IMRT technique was implemented in our hospital in September 2007. Here we demonstrated evident advantage issues for the use of the technique in some cases treated with (fig. 3,4,5,6) and without (fig. 1) IMRT. Patients were treated in a Linear Accelerator 6MV photons (Varian 6EX), and the planning was done using a software system Eclipse vs 7.2 with Varis software (Varian). The quality assurance and quality control (QA/QC) were performed by dosimetry in films and Matrix tests, for every patient before the treatment (fig. 2).

RESULTS: From September 2007 to September 2008, IMRT was used in 18/120 patients (10 M, 8 F), ~18 y (15%). Their median age were 6 y (range 1 to 18 y). IMRT was used for the following malignancies: head and neck (H&N) rhabdomyosarcoma (n=4), nasopharynx tumour (n=1), nasoangiofibroma (n=2), esthesioneuroblastoma (n=1), neuroblastoma in the pelvis and spine (n=1), skin cancer (n=1), brainsteam tumour (n=3), other brain tumours (n=4) H&N rhabdomyosarcoma re-treatment (n=1). The mean fields number was 5.5 (range 5-9). Almost all radiation treatments were delivered with concomitant chemotherapy. In some H&N tumours with different volume prescription, we kept the dose between 1.7 to 1.92Gy/fraction. However, in these patients, we experimented increased acute side effects (mucosites) and therefore, in the last group of patients treated, we decided to do different phases of treatment in order always to keep 1.8Gy/fraction in the volume prescription. The use of dedicated moulds and masks specialized in pediatric patients are scarce in low income countries and the challenge of reproducibility in such complex technique is frequent.

CONCLUSIONS:
• We observed in our experience an advantage of IMRT to treat pediatric patients with H&N and CNS tumours.
• Lower radiation doses can be delivered to the orbit, chiasma, brainsteam, salivar gland, cochlea and uninvolved brain outside the PTV, and provide a distinct advantage to the patient.
• The dose/fraction should be kept in less than 1.8Gy even if it implicates in a treatment with different phases.
• Hot spots in bone tissue should be avoided in children to prevent growth disturbances.
• No benefit to IMRT use in common pediatric malignancies in the extremities, abdominal and thoracic region was observed.