end of December 2000 (each patient had made measurement once or two or three times). Semiconductor detectors (with DPD 510 by Scanditronix) were used during *in-vivo* dosimetry. Doses were calculated and measured in (1) the centre of the irradiation field; (2) supraclavicular region; (3) mediastinum; (4) lower edge of the field and (5) neck. Patients were irradiated at various accelerators, most of them at Neptun with photons 9 MeV.

Results: All patients were divided into three groups. The criterion of inclusion was the per cent difference between calculated and measured doses average for all dosimetrical points. The ranges for the groups were: 0-5%, 5-10% and over 10 %. The mean per cent differences in the first group of 43 patients was 3.1%, in second of 27 patients – 6.3%, and in third of 6 patients - 17.6% respectively. There was no clear reason, beside an accidental error why for the certain patient difference was much larger than for the another. Mean difference for all groups was equal to 5.3%.

In the table mean per cent differences between doses calculated and measured and their standard deviations (SD) in the whole group of patients are shown for central axis, mediastinum and supraclavicular region.

central axis		mediastinum		supraclavicular region	
Mean diff.	SD	Mean diff.	SD	Mean diff.	SD
1.5%	4.1%	-0.3%	4.6%	2.0%	5.7%

Conclusion: Mean difference in the whole group of patients shows good agreement between pre-calculated and measured doses, especially for three clinically important regions (table). It is accompanied by low standard deviation which is an indicator of small deviations between doses inside the whole group.

6.
THE TECHNIQUE OF TOTAL BODY IRRADIATION APPLIED IN THE ST. LESZCZYŃSKI MEMORIAL HOSPITAL IN KATOWICE

A.Kawa - Iwanicka, M. Dybek, T. Iwanicki, W. Łobodziec, A. Radkowski

Radiotherapy Department of the Hospital - Memorial St. Leszczyński, Katowice

At the St. Leszczyński Memorial Hospital in Katowice a modification of *TBI* technique was prepared. For this a special two variant of body frame - one for treatment planning and an another one for treatment delivery - was made. The total dose of 12 - 15 Gy (in lung not more than 9 Gy) was delivered in six fraction of 15 MV photons, produced in Primus linear accelerator, for 3 consecutive days. Patient was treated by a combination of fields: lateral - set at *SSD* of 330 cm and *AP/PA* - set at 135 cm. The dose-rate measured at 10 cm in a water phantom for lateral fields was 4,3 cGy/min., and for *AP/PA* fields 23,6 cGy/min. Lung shields were made from wood alloy and their shape was carried out from computerized tomograph scans (*CT*). For each patient a set of computerized tomograph scans was prepared. Patient during the *CT* was laying in supine position in the body frame made of 1 cm thick plexi plates. On the walls of that body frame a special marks of tin material were inserted. These marks allow to reproduce both - the same patient position during the irradiation and also in the treatment planning system *HELAX.* Position of shields before *AP/PA* fraction was determined by means of *HELAX,* and then shields were fastened to plexi trays inserted in the head of Primus. Lung was also shielded during one lateral fraction and the shape of the shield was carried out on a simulator. The volume between the patient and walls of the body frame was fulfilled by bolus (bags with rice) to get a homogenous dose distribution. The electron boost to the thorax wall (shielded for 15 MV photons) was delivered with a 6 or 9 MeV electron beam.

The percentage deviation of dose, for all 9 irradiated patients, calculated at ten anatomical points representative of the body anatomy, was in the limit -0,4% to +13% (excluded in lung) from the dose delivered to *PC* (reference point: 1/2 *AP* and 1/2 lateral dimension at 1/2 of patient length in irradiation position). The *in vivo* measurements carried out by means of MOSFET detectors confirmed that accuracy.

7.
IMRT – NEW STANDARDS IN TREATMENT PLANNING

A. Grządziel, K. Ślosarek, R. Rutkowski, A. Rembielak

Treatment Planning Unit Center of Oncology - MSC Memorial Institute, Gliwice, Poland

Technological advances in medical imaging have prompted accelerator manufactures to produce more and more advanced treatment delivery systems capable to precise shape the dole distribution.

For several years radiation beams have been modulated by mechanical and dynamic wedges, compensators, individual shields and unequal beam weights. Nowadays three dimensional conformal treatment and intensity modulated radiation therapy techniques (IMRT) provide very precise conformation of the dose to the target volume while sparing adjacent healthy tissues. On the other hand conformal radiotherapy requires very precise definition of anatomical structures, improved patient repositioning systems. New challenge represents quality control program and treatment verification.

IMRT was introduced in clinical practice in Center of Oncology, Glivvice in year 2000. Such treatment is delivered by Clinac 2300 with dynamic MLC option, on the base of dose distributions calculated by CadPlan-Helios treatment planning system, and sent via Varis to accelerator.

The aim of this paper is to present our experience with IMRT technique with particular regard to IMRT treatment plan (definition of PTV and calculation factors like Termination Tolerance, Priority Factor, Scatter Factor).

8.
EVALUATION OF A NEW SYSTEM FOR IN-VIVO DOSIMETRY BASED ON MOSFET DETECTORS

P.F. Kukołowicz, K. Buliński, K. Lis, J. Miedzińska

Holycross Cancer Centre, Medical Physics Department, Kielce, Poland

Purpose: In Holycross Cancer Centre in Kielce in vivo dosimetry is performed with new miniature detectors called MOSFET. MOSFETs are advertised by Thomson &Nielsen company as almost ideal detector for in-vivo dosimetry: they are isotropic, can be treated as point detector fully transparent to treatment beam, having zero temperature and negligible energy effect, can be used either for electron and photon radiation, in teletherapy and brachytherapy, can be used in several QA procedures, very easy and convenient for handling and very low time consuming. Our experience both from extensive tests and clinical use will be presented.

Results: From our experience MOSFETs detectors can be treated as isotropic, are fully transparent for radiation, can be used both in teletherapy and brachyterapy. For application in brachyterapy special catheters with lead localisation markers must be used. The energy dependence cannot be considered as negligible. For 6 and 15 MV X photons calibration factors differ of about 5%. Reproducibility depends strongly on the dose. It decreases very much for very small doses (for dose 60 cGy - 1 standard deviation is of 2,5%). Very useful advantage of MOSFET detectors is their applicability for surface dose measurements. More details will be presented during the congress.

Conclusion: MOSFET detectors can be effectively used for in-vivo dosimetry in tele and brachytherapy. The reproducibility should be improved.

9.
COMPARISON BETWEEN CONVENTIONAL SIMULATOR PLANNING AND CONFORMAL 3-D PLANNING FOR CERVICAL CANCER TELETHERAPY

K. Bratos, A. Roszak, E. Cikowska-Woźniak, T.Piotrowski

Wielkopolskie Centrum Onkologii, Poznań, Poland

The using of simulator planning based on bony landmarks for pelvic irradiation of cervix cancer is associated with a risk in a geographical miss, which may be generated by inadequate knowledge of the individual anatomy. 3D treatment planning system let us know an individual topography of pelvic organs, enables to mark a PTV and it allows more adequate coverage. PURPOSE The aim of this study was to evaluate a benefit resulting from 3D treatment planning for teletherapy of cervical cancer. MATERIAL AND METHOD In our study on 15 patients with cervical carcinoma in the stage IIIB simulator planning of „box" technique was performed. Next we defined the PTV in 3D-planning system and compared the dose distribution, obtained with both methods, in the target volumes and organs at risk using dose-volume histograms. RESULTS In 4 of 15 patients the encompassment of the PTV by the treated volume was inadequate in case of simulator planning. The treated volumes based on 3D-planning were 8% smaller than volumes based on simulator planning. The treated volume/ planning target volume ratio was 1,64 for simulator planning and 1,50 for 3D planning. 3D-planning system resulted in a reduction of the irradiated bladder volume(-12%) and the bowel volume (-9%). The bladder and bowel