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Introduction. Helical Tomotherapy (HT) is a modality for delivering intensity modulated radiation therapy (IMRT) treatments using a rotating linear accelerator mounted on a continuously moving slip ring gantry in synchrony with the couch motion. HT allows performing stereotactic radiotherapy treatments without fiducial markers due to its 3D imaged guided system. Lung SRBT treatments has been selected as a routine treatment in our facility. Effects of respiratory motion are reduced using an abdominal compression paddle to restrict tumor motion and normal tissue irradiation. Moreover, HT achieves very homogeneous dose distributions, leading to local tumor control and survival results comparable to surgery. These IMRT treatments require patient-specific verification previous to the irradiation, as routine in other IMRT modalities.
Purpose. The aim of this work is to describe the quality assurance (QA) protocol for the verification of lung SBRT treatments performed on HT.
Materials and methods. Prescription doses to PTV were between 45 and 60 Gy on 3 fractions. Treatment plans were recalculated using a solid water cylindrical phantom (Tomophantom) that allows simultaneous measurements with Exradin A1SL cylindrical ionization chamber (i.c.) in 29 different positions as well as radiochromic EBT2 film irradiation, usually located in a coronal plane. Dose measurements were compared to values from the HT treatment planning system (TPS). Film analysis was performed with OmniProm I'mRT software and gamma pass rate was evaluated.
Results. Dose differences between TPS calculations and i.c. measurements were mostly within +3%, with −0.7% mean value, ranged from −3% to 2%. Gamma analysis evaluation showed an agreement superior to 97% (95-100) for 3%,3 mm criterium.
Conclusions. The QA protocol proved to be an effective method for verification of lung SBRT treatments. Results showed good agreement between calculated dose from TPS and measurements with i.c. and film.

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Positioning protocol image guided for radiotheraphy

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Objective. To show the procedure we apply for our radiotheraphy treatments.
Material and methods. Linear accelerator ARTISTE SIEMENS. We check during the first three days the patient position relative to the treatment beams. We have determined by means of portal image or cone bean. We collect the movement X, Y, Z and the absolute vertical position of the couch in a database. We calculate on the fourth day the average of the three days and modify the initial SETUP. If with this corrected SETUP on the fourth day, no correction is necessary, we apply it for the rest of the treatment and do weekly checks. If on the fourth day, a correction is required, we repeat on the fifth and sixth day and on the seventh day we calculate the average and apply. If the application of the average does not need any correction we apply this average for the rest of the treatment. We have a weekly control check. If the average needs correction, we consider the patient unstable, and we will do portal image or cone bean, daily.
Results. 1. ORTHOGONAL PORTAL IMAGE, 3 initials + week: Breast, palliative: – 10 sessions 2. CONE BEAN 3 initials + week: Lung, otolaryngologist, Rectum, Cerebral, Lymph, Stomach, Pancreas, Esophagus 3. ORTHOGONAL PORTAL IMAGE + 1 week: Cranial irradiation 4. DAILY PORTAL IMAGE: Palliative care: 5 sessions 5. DAILY CONE BEAN: Prostate.
Conclusions. We collect in a database the necessary information that we use for a good daily positioning, minimizing an error that we could apply to the positioning of a patient every day.

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Rapid Arc vs IMRT of prostate plans: A dosimetric comparison

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Introduction. The arrival of Rapid Arc (RA) technique has gradually replaced IMRT treatments at our unit.
Objectives. To evaluate the dosimetric outcomes of prostate treatment plans and the possibility of reduction of peripheral dose and treatment delivery time.
Material. Ten cases are planned to target a prescription dose of 78 Gy of mean dose in PTV and D95 > 95%, in 2 Gy/fraction, for a 5 field IMRT (G265°, G312°, G0°, G47° and G95°) and two full Rapid arcs, delivered with Varian Clinac iX, for a beam energy of 6 MV and a maximum dose rate of 600 MU/min. The CBCT performance allows the acquisition of KV images for positioning and evaluation of changes in bladder and rectum size. Treatment planning system used is Varian Eclipse 8.9.17 with inverse