also found that system doesn't provide sufficiently correct information for both rotation and translation when the angle is higher than 3°. Though this issue needs to be investigate further.
In the second experiment we found a good correlation between EPID and AlignRT. Mean difference in the lat, long and vert direction was 0.052 ± 0.064 cm, 0.030 ± 0.084 cm, -0.130 ± 0.064 cm, respectively. Agreement of AlignRT with the couch position was in lat -0.027 ± 0.043 cm, long 0.003 ± 0.040 cm and vert 0.005 ± 0.050 cm.
Conclusions: The AlighRT system is accurate and well correlated with our EPID verification method thus we will use it in the clinic for patient positioning. We have found that accuracy of our treatment table on one linac, is more an issue here, not the AlignRT software itself. Regarding the AlignRT setup information we have created a special protocol. We will use a 3 DOF (translations only) and maximum accepted rotation 3°. Any higher detected rotation have to be corrected independently.

EP-1419
WBRT WITH SIB TO OLIGOMETASTASES IN THE BRAIN USING VMAT-IGRT AND A NEW AND PATENTED DEVICE FOR IMAGE FUSION
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Purpose/Objective: Whole-brain radiation therapy (WBRT) combined with a boost on the metastases has been proven to improve treatment results in selected patients in contrast to single WBRT. The prospective randomized Radiation Therapy Oncology Group study 9508, analized the effectiveness and toxicity of hypofractionated stereotactic radiotherapy (HSRT) in patients with up to three brain metastases. We retrospectively evaluated it with Elekta Synergy VMAT and a patented system to achieve high quality fusion image and immobilization.
Materials and Methods: The procedure implemented in our service consists of an improved thermoplastic immobilization by means of a sub-mask of high density silicone. A similar number of CT and axial magnetic resonance images were acquired for planning, both taken with exactly the same position and immobilization as in simulation, with a slice thickness of 2mm. The resulting image fusion was of excellent quality.
The treatment was designed with the inverse module for VMAT of Pinnacle v.9 (SmartArc), with multiple arcs performed with Elekta Synergy. The dose scheme employed is the Lagerward one: [WBRT(20Gy)+SIBmts(40Gy)] / 5 frac .
Daily patient positioning was checked with IGRT (Elekta XVI).
Results: The First step was prophylactic whole brain irradiation. We planned two arcs VMAT CCW (178º-60º and 300º-182º)with the following targets: brain (Dmax=21Gy, weigh=100 and Dmin =20Gy, weight=50), eyes (Dmax=10Gy, weight=1). Later on, we focused on metastases separately. For this purpose, we removed from the optimization the achieved prophylaxis (Optimization Type None) and created three supportive structures: VI1=PTV (mts1) +5mm, VI2=PTV (mts2) +5mm, Epx=encephallus-VI1-VI2. The targets were: PTVi (Dmax=44Gy,weight=100 and Dmin=40Gy weight=50), Epx (Dmax=30Gy) and brain stem (Dmax=23Gy). We made a prescription for the arcs of the encephalic prophylaxis of 20Gy, plus 20Gy more to each one of the metastases.
Treatment verifications were performed with the Multicube-Matrixx system having fulfilled conditions of 3% gamma, 3mm.
Until now we have treated five patients, being the differences in fusion images less than 1mm and mean IGRT correction of 1.13mm.
Total time spent of the process, including contouring, treatment design and verification, without considering the learning curve, is about 7 hours.
Conclusions: HSRT in patients with up to three brain metastases with our inmobilization system, IGRT and VMAT can be considered as a feasible stereotactic treatment for brain metastases under a radiobiological theoretical valuation of the toxicities and the physical doses administered to the target.

EP-1420
ADAPTIVE CLINICAL COMMISSIONING OF MONACO VMAT: MAXIMIZING EFFICACY WITHOUT SACRIFICING SAFETY
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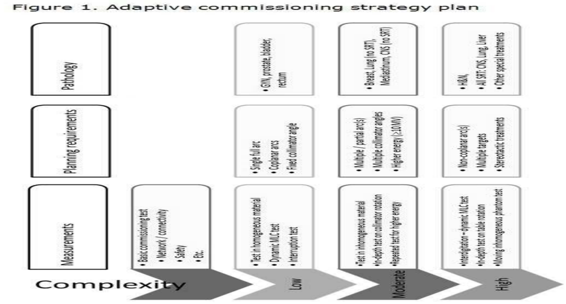
Purpose/Objective: Clinical commissioning of a treatment planning system (TPS) with advanced delivery technique (IMRT, VMAT) is a labor intensive process requiring effort from the medical physicist team as well as considerable machine time. As the commissioning itself does not reveal the clinical potential of the TPS, effort should be made to combine both aspects towards an efficient introduction into a daily clinical routine. Our aim is to define such adaptive strategy to provide a quick launch of the Monaco VMAT TPS, while maintain safe commissioning strategy.
Materials and Methods: Different pathologies are identified and prioritized for the commissioning, considering the complexity of the planning and the demands from a clinical point of view. Parallel to this effort, based on commissioning protocols for IMRT [1,2] and VMAT [3] all required tests are categorized aligned with the clinical complexity. Requirements from two aspects are classified under a strategic plan as low, moderate and high complexity stages, allowing the responsible physicians, planners and physicists to maximize their focus and joint effort in the preparation phase of each level.
Results: The resulting strategic plan (Figure 1) developed at our institution. Corresponding planners are asked to perform planning studies with respect to selected pathologies or tumor sites, while physicists carry out measurements according to the stage requirement. After completing both requirements for each complexity level, final stage approval is given by the leading team of our department, keeping clear traceability for all teams what milestones are achieved. By this strategic plan the clinical commissioning is streamlined resulting in the first stage (low complexity) to be ready within one month (less than 20 hours machine time) after the Monaco VMAT model was ready. During this period knowledge gathered on the planning challenges was be used to adapt further tests required at the next stage, while the system can be used for numerous pathologies in the meantime.

Figure 1. Adaptive commissioning strategy plan



Conclusions: The presented adaptive strategy is a feasible option during commissioning of Monaco VMAT. The first few pathologies can be treated after ~ 20 hours machine time, and the planning knowledge can be used to adapt further stage requirements.
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IMRT MACHINE QA USING DELTA4 ROTATIONAL DOSIMETRY SYSTEM
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Purpose/Objective: In the past decade, intensity modulated radiation therapy (IMRT) have been the technique of choice when treating cancer due to high target dose conformity and improved sparing of normal tissue surroundings. Whilst these treatments are time efficient and have good dose conformity, they place great demands on the performance of radiotherapy machines and MLC leaf positions. As a result, quality assurance (QA) of radiotherapy machines has had to cater for these changes in developing new techniques as well as reducing the time to perform them.