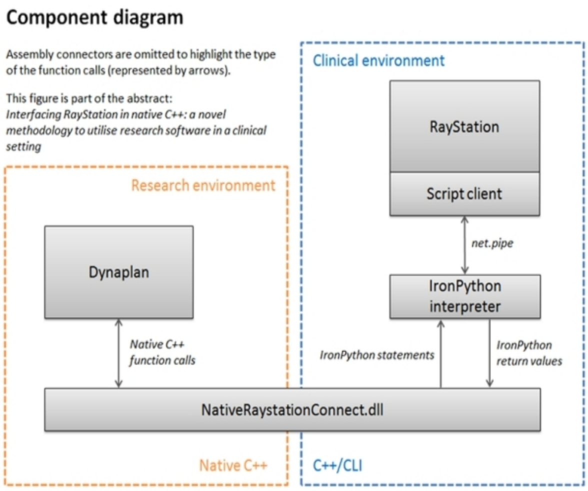
C++/CLI function calls. The interface connects to RayStation by identification of its process ID and setting up a pipe to its scripting client. The library handles the required memory conversions and communicates with a RayStation instance through direct IronPython calls. The NRC interface was tested by its integration in our in-house research TPS Dynaplan. **Results:** A clinical case for a prostate treatment was imported from the RayStation database into Dynaplan through the NRC interface. After the generation of a treatment plan in Dynaplan, the respective leaf configurations were sent to RayStation (through the NRC interface) and incorporated into a new plan and beam set. Subsequently a dose calculation request was sent to RayStation. An automatic window focus change to RayStation allowed for clinical approval of the dose distribution, which in the meantime was also sent to Dynaplan.



Conclusions: We successfully developed a library to interface the RayStation scripting API through native C++, allowing a risk decrease for the use of research software in a clinical environment. We could show by example how the NRC interface can be used in Dynaplan by exploiting the synergy of scripted access to a certified TPS and the power of traditional programming models. The legal implication on in-house developed software used in combination with an API of a certified TPS will need to be further evaluated based on local and European legislation changes.

EP-1441

Evaluation of Eclipse Rapidplan for semi-automatic treatment planning of prostate radiation treatment

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Purpose/Objective: Quality of modulated treatment plans is highly dependent on the planner skill and experience. Plan optimization is also a time consuming process which involves several iteration cycles before an acceptable plan is achieved. Rapidplan (Varian Medical System, USA) is a semi-automated planning solution which promises to increase treatment planning efficiency and result in a more consistent plan quality as compared with individual manual optimization. The treatment planning process with Rapidplan relies on the creation of a model, obtained using high quality treatment plans previously optimized. A prostate model made available by Varian has been implemented in Eclipse (Varian Medical System, USA). The aim of this study was to compare the quality of plans created with the Eclipse prostate model and the model generated with plans from our institution with the manually optimized prostate plans.

Materials and Methods: In total 40 post-operative prostate plans were retrospectively used in this study. Patients were planned with a dose fractionation 33x2Gy. 30 out of these 40 plans were used to create an in-house prostate model. Varian's prostate model and our model were used to re-optimize ten prostate plans. The manual optimization was compared to the semi-automatic optimization obtained with the Varian and our prostate models. The comparison was done based on DVH parameters and MU. The target volume receiving 95% of the dose was compared between optimizations. The major OAR in postoperative prostate treatment is the rectum and at our institution it is paramount to achieve a high sparing of this OAR. The rectal volume receiving 40Gy (V40), 60 Gy (V60) and 65 Gy (V65) was compared between optimizations. Additionally the mean and max doses to the femoral heads were compared.

Results: Rapidplan was easy and fast to use and no re-optimization was required. The semiautomatic plans using the Varian prostate model reached a better PTV coverage respect to our plans (average V95 was 99.4% vs 97.2%). For the OAR, large dose differences were observed between Varian model optimized plans and our plans. Rectal V40, V60 and V65 were in average 90%, 40% and 14% lower for the plan optimized by us than the one optimized using the Varian model, but the maximal dose to the femoral heads was in average 6 Gy higher. Total MU was in average 20% lower for the semi-automated optimized plans.

Conclusions: Rapidplan is user friendly and requires less user input than manual optimization. The plan optimization and calculation was done at our station within 1 hour. Varian provides a prostate model which was developed by the Cancer Care Manitoba (Winnipeg – Canada) and it is based on the experience and treatment rationale in this clinic. We found that this model provided plans which are dosimetrically very different to what is currently expected and accepted in our clinic. Therefore our own model needed to be developed.

EP-1442

Investigating the impact of treatment delivery uncertainties for lung SABR: a pilot study

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Purpose/Objective: Advanced RT techniques require conservative approaches to be taken due to a lack of detailed knowledge about treatment delivery uncertainties. For example, safety margins are added to target volumes and in-