nearest whole number. The median DVH value of new genitalia contours denotes the optimal constraint and the 75th centile denotes the mandatory constraint. It can be observed that new recommended dose constraints contrast the current dose constraints highlighting the need for gender and tumour stage specific genitalia dose constraints.

Conclusion: Dosimetric differences exist between genders and between patients with and without involved nodes when defining genitalia contours with aid of an atlas. Current generic set of genitalia dose constraints are inappropriate and gender/tumour stage specific constraints have been recommended.

OC-0470
Library of plans in radiotherapy of rectal cancer: feasible and inter-observer consistent?
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Purpose or Objective: The clinical target volume (CTV) in rectal cancer is subject to large deformations. These deformations result in large margins when a planning target volume (PTV) is constructed with a population based method. A preferred approach uses a library of plans (LoP) and is expected to result in smaller PTV margins. A LoP requires a selection of the best fitting plan based on a Cone Beam CT (CBCT) scan. This triggers the questions: ‘Is the visibility of the target volume sufficient for plan selection?’ and ‘Do the plan selection choices of Radiation Therapists (RTT) coincide?’ The purpose of this study is to determine feasibility in plan selection for a LoP in radiotherapy of rectal cancer.

Material and Methods: Thirty rectal cancer patients were included in this retrospective study. All patients received a radiation dose of 25 Gy in 5 fractions of 5 Gy, with on-line position verification. Instructions for the patient on the planning-CT were: full bladder and empty rectum. The CTV was defined on the planning-CT (pCT) and contained the mesorectum, presacral area, pelvic lymph node areas and gross tumor volume (GTV). From the this single CTV a library of CTVs was constructed with in-house built software using population statistics on daily rectal deformations. The library consisted of five plans: two larger, two smaller and the original plan, see figure. We performed a baseline measurement with 4 observers (all RTTs). The observers separately selected plans on 150 CBCT scans based on a priori set of instructions (Observer study I). The study was followed by multiple consensus meetings with an experienced radiation oncologist to discuss deviating choices and refine the instructions. A golden standard was determined for each scan. After 5 months the observers were asked to reevaluate the same set of scans based on the refined guidelines (Observer study II).

Results: Observer study I: The scan quality was determined to be sufficient for plan selection. In 69 % of the cases the observers were in accordance with the gold standard. 29 % of all selections deviated by 1 plan and 2% deviated by 2 plans. The consensus meeting revealed that inconsistency in choices arose from inadequate instructions. For instance, should an air pocket rather far from the GTV also be covered within the CTV? Instructions were clarified, and more specified. Observer study II: In 87% of the cases the observers were in accordance with the gold standard and 13% of all selections deviated by one plan.

Conclusion: The observer study showed a good consistency in selecting the plan that would fit best on the anatomy of that day, even given the suboptimal CBCT image quality. Clinically, the occasional selection of a plan that deviates by one from the gold standard is deemed acceptable by the radiation oncologist. Therefore, plan selection based on daily CBCT by RTT for rectum patients is feasible, albeit room for improvement remains.

OC-0471
Influence of rectum volume on fine-tuning of image registration in bladder adaptive radiotherapy
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Purpose or Objective: The influence of rectum volume on fine-tuning of image registration in bladder adaptive radiotherapy treatment

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