given as radical or adjuvant treatment for PC in 4 and 5 patients respectively and as neoadjuvant therapy for rectal cancer in 1 case. The median dose of prior RT was 70 Gy (range 45-76) and the median time between the first and the second RT course was 117 months (range 95-219). The total dose of retreatment was 50 Gy in 5 patients and 60 Gy in 2 (2 Gy daily fraction). Patients immobilized with Combifix device underwent planning computed tomography (CT) with 3-mm slice thickness; they were instructed to receive RT every day with an empty rectum and a full bladder. Clinical target volume (CTV) was the prostate in 5 and the PET positive nodule in 2 patients. Organs at risk (OAR) were: rectum, bladder, penile bulb and femoral heads. Planning target volume (PTV) was obtained by adding 3-5 mm to the corresponding CTV. The parameters used in HT planning system were: field width 1 or 2.5 cm, pitch 0.287 and modulation factor ranging from 2 to 3. Median duration of treatments was 180.7 seconds (range 145-347.8).

Results: Median follow up was 7 months (range 3-38). All patients completed the reirradiation course. PTV median size was 66.65 cc (range 7.91 – 114.26). The cumulative mean dose (D mean) to the rectum ranged from 37.87 to 73.83 Gy and the cumulative rectal maximum dose (D max) ranged from 112.66 to 119.85 Gy. The cumulative D mean to the bladder ranged between 19.84 and 83.79 Gy; cumulative D max ranged from 93.99 to 126.3 Gy. When total dose was 50 Gy, the OAR dose volume constraints were: V10< 40% and V25<10% for rectum; V10<20%, V25<10% and V44<2% for bladder. When total dose was 60 Gy the constraints were: V10<30% and V30<1% for rectum and V10<15%, V30<10% and V50<5% for bladder. Acute grade 2 genitourinary toxicity was observed in 3 patients and grade 2 gastrointestinal toxicity in 1 patient. Three months after retreatment all patients had early PSA decrease; only 2 patients experienced biochemical relapse due to pelvic nodal recurrence. One patient died for bladder cancer.

Conclusions: PC patients benefit from salvage reirradiation with HT. The treatment was feasible and well tolerated, with low rates of acute toxicity. Longer follow up is required to confirm retreatment safety and evaluate late toxicity.

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From datasets to predictive models: could an ontology development improves clinical choices in prostate cancer?

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Purpose/Objective: Even if many advances have been done in cancer care, clinical choices are based on evidence-based guidelines, resulted from large randomized trials often, and applicable only to population subset. Need of 'tailored treatment' can require specialized Decision Support System (DSS). Therefore, creation of large, and heterogeneous databases, could implement and validate DSS based on predictive models. In order to share the same meaning between people involved in the project, an ontology need to be created **and shared**. Our aim is to build a prostate cancer ontology able to represent a list of the main concepts involved in this semantic domain and how those concepts are related, by a graph.

Materials and Methods: We built ontology starting from a well-defined data collection model, able to collect, standardize and organize concepts related with prostate cancer patients. These features were organized according three different levels. The first, Registry level, includes all general epidemiological information (age, gender, e.g.). The second, Procedure tier, includes information about treatment and toxicities, and outcome evaluation. The last, Research level, includes clinical, imaging and Quality of Life information for advanced research projects. Relationships between concepts have been added as last step. The so built ontology describes each of these concepts with a unique reference, preferably mapped to a published coding system (e.g. NCI Thesaurus, CTCAE).

Results: Building an ontology is a good strategy to standardize data and procedure and create a consistent dataset. We selected more than 200 variables related with prostate cancer. The three data storing tiers were used to classify all the information to easily develop queries depending on the analysis different (epidemiological, toxicity, outcomes e.g.). Many concepts can be shared with ontologies related other cancer sites (general idea of toxicities, TNM, etc.) while others are prostate specific (PSA, etc.). We decided to adopt a trade-off between the formal explication of the ontology and the effective usability of it: even if a formal ontology is a powerful tool to allow automatic inference and represent in a not-ambiguous way a semantic, it is hard to be handled and properly validated.

Conclusions: Sharing and combining multiple dataset, through structural collaboration between different groups, are the basis to generate large databases. Computer Science allows us to share concepts in a not ambiguous way in order to do that, by using ontologies and related languages. Through an ontology creation we obtained a standardized and organized dataset, easy to be shared and understood, not ambiguous, mapped on most common international standards and suitable to create predictive models which complement existing consensus or guidelines, moving from prescription by consensus to prescription by numbers.

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Evaluation of interfractional bladder doses for two different patient positioning methods in prostate cancer

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Purpose/Objective: The aim of this study is to evaluate the changes in bladder doses during the volumetric modulated arc therapy (VMAT) treatment of prostate cancer patients using weekly cone beam computed tomography (CBCT) data.

Materials and Methods: Ten consecutive patients with prostate cancer treated by radical RT were considered. For each patient, pre-treatment CBCT performed on a weekly basis were analyzed by using two different methods of target localization (intraprostatic fiducials and bony anatomy). To evaluate the changes in bladder doses; organs of interest were contoured on each weekly treatment CBCT data set and the images, along with the contours, were registered to the original planning CT. The replanning was made on planning CT using contours transfered from CBCT for two different