Conclusion
It is possible to decrease the dose in the neurovascular beam more than a 50% with our technique based on hyaluronic acid injection, however long-term follow-up will be necessary to determine the extent and benefit to the patient with this procedure.

EP-2258 HIPO inverse planning utilizing constrained CVT for HDR brachytherapy of prostate cancer
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Purpose or Objective
The Hybrid Inverse Treatment Planning Optimization (HIPO) is a valued tool for treatment planning in HDR brachytherapy. Developed by Pi-Medical (Athens, Greece), nowadays available in the Oncentra™ Prostate (OcP; Elekta-Nucletron, Veenendaal, Netherlands). HIPO is utilizing a hybrid method for solving the inverse planning problem combining a heuristic to adapt the position of the catheters with a deterministic algorithm to adjust the dwell-times for the stepping source. Solving the optimization problem of catheter positioning requires a high number of iterations resulting in execution times up to several minutes. Therefore potential methods improving the HIPO performance and/or plan quality are currently under investigation by our group.
Material and Methods
The centroidal Voronoi tessellation (CVT) based on the anatomical structures is utilized to calculate catheter positions for HIPO initialization. A basic CVT and a constrained CVT (CCVT) with varying density is investigated. The catheter positions calculated by the CVT/CCVT algorithms are adapted to the template grid of 2.5mm using the least-squares fitting and imported into OcP for the initialization of HIPO. Parallel HIPO execution and the option to select dose-volume constraints as stop condition (adaptive mode) for HIPO are features only available in the research version of OcP (v4.2.21) provided by Pi-medical. A total of 8 plan categories have been considered, CVT and CCVT without HIPO catheter adaption as well as six categories with HIPO catheter adaption combining default and CCVT-based HIPO initialization with different HIPO stop conditions (300 or 2000 iterations and adaptive mode).
Dose-volume indices for PTV and OARs (urethra, rectum), homogeneity index (HI), and conformal index (COIN) were assessed. Statistical tests were performed with the pairwise Wilcoxon signed-rank test at 5% level of significance. 15 clinical implants with mean prostate volume of 40cc (20cc to 69cc) have been considered. The number of catheters clinically used was applied (12 to 24). The Offenbach dosimetry protocol was implemented.
Results
For the two categories, CVT and CCVT without HIPO catheter adaption, significant improved indices for all OARs were found for CCVT. Consequently only CCVT was considered thereafter.
The total objective function (TOF) converged faster for HIPO initialization with CCVT; only 965 iterations with CCVT achieved the value of 2000 without CCVT for the TOF. CCVT initialization reduced the number of required HIPO iterations to fulfill all dose-volume constraints on average by 32% (361 versus 242 iterations). After 300 iterations HIPO with CCVT generated plans with significantly improved dosimetric indices for the PTV and OARs.
Conclusion
By introducing a CCVT-based initialization for HIPO, a significant improvement of HIPO performance regarding both execution speed and dosimetric quality of calculated implants in the HDR prostate brachytherapy pre-planning has been demonstrated.

EP-2259 Survey of Prostate Brachytherapy practice in the UK & Ireland 2014-2016
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Purpose or Objective
The purpose of this survey is to document the ongoing development in UK & Ireland prostate brachytherapy including both High dose rate (HDR) and Low dose rate (LDR) practice.
Material and Methods
An online survey was created and the hyperlink was communicated to centres (n = 25) attending the UK & Ireland prostate brachytherapy conference (Belfast, 2017) inviting them to provide one response per department. Sixty three questions were grouped into 6 themed sections which included (i) Current experience and staffing (ii) Number of implants by clinical oncologist in 2016 (iii) Implant number (last three years) (iv) LDR pre-implant technique (v) LDR post-implant technique (vi) HDR implant technique. Responses were collated and descriptive analysis performed.
Results
Eighteen centres (72%) responded (11 LDR only, 6 HDR & LDR, 1 HDR only) with thirteen centres (76%) having > 10 year experience with LDR and five centres (71%) having > 5 year experience with HDR respectively. Thirteen centres (72%) have two or more clinical oncologists, fifteen centres (83%) have two or more medical physics experts and eleven centres (61%) have at least two therapy radiographers. 61% of lead clinicians performed > 25 implants (HDR and LDR) with 22% performing > 50 implants in the year 2016. In the last 3 years, 44% of centres reported the number of LDR monotherapy cases as stable while 44% noted a reduction in numbers. Similarly 40% of centres reported LDR boost cases as stable, 40% as reduced and 20% with increased cases. The number of centres using HDR as boost, monotherapy and salvage therapy has increased, with increased cases in the year 2016 as compared to 2014. For LDR pre-implant, 82% of centres perform brachytherapy as a 'real-time' implant. I-125 seeds are predominantly used as stranded loading (60%) with preferred reference air kerma rate of 0.5 – 0.6 U (71%) for planning. All centres perform post implant computed tomography (CT) scan with 88% (n=15) performing the scan 4-6 weeks later. Thirteen out of seventeen responding centres perform routine calculation of the CT/Ultrasound (US) volume. The median CT/US volume ratios were >0.9 ≤1.0 (n=4), >1.0 ≤1.1 (n=7) and >1.1 (n=2). Average post implant D_{90} was > 145Gy in 63% of centres in 2014 and 2015 compared to 70% in 2016. 50% of centres reported average D90's of > 155Gy in all three years surveyed. The majority of centres performing HDR prescribe 15Gy for boost and 19Gy for monotherapy. The average percentage of the target volume receiving 100% of the dose ($V_{100\%}$) is 95-98% (n=4), less than 95% (n=1) and 98-100% (n=2).
Conclusion
The use of the three key quality assurance markers in LDR of D_{90}, CT:US volume ratio and $V_{100\%}$ is universal across responding centres and the reported D_{90}'s suggest high quality implants are performed across the region. An apparent fall in LDR monotherapy and boost cases but increase in HDR numbers noted.