Results: There were 153 patients: 45 (29%) EGFR+ and 108 (71%) EGFR WT. The median age was 66 years (range, 38-88). The population was composed of 38 (25%) Asian ethnicity, 54 (35%) never-smokers, and 97 (63%) female sex. The maximal diameter of the primary tumour on PET imaging was no different between the two EGFR cohorts (mean 4.0 versus 4.0 cm; p = 0.9). The SUVmax ranged from 1.1 to 28.9. There was no difference in SUVmax between EGFR+ and EGFR WT cohorts (mean 10.4 versus 10.6; p = 0.9). There was a significant correlation between larger tumour size and higher SUVmax (r = 0.47; p < 0.01). Median survival was significantly longer for the EGFR+ cohort (28.4 versus 14.0 months; p = 0.02). On multivariate analysis, when accounting for tumour size, SUVmax was not a significant factor for survival (p = 0.8).

Conclusions: In our study there was no correlation between FDG-PET uptake and EGFR mutation status in patients with metastatic NSCLC. The SUVmax cannot be used to predict EGFR mutation status or survival.

31 LESSONS LEARNED IN CONVERTING FROM LDR TO HDR PENILE BRACHYTHERAPY
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Purpose: Decades of reported experience with low dose rate penile brachytherapy have demonstrated local tumour control rates and penile preservation of 70-85% at 5-10 years with acceptable side effects. Manual source loading is not available in most centres in North America so there is a need to explore the transition to high-dose rate (HDR) automated afterloading for treatment delivery. Dose homogeneity parameters and fractionation schemes need to be developed and validated.

Methods and Materials: Prior experience in interstitial template-based penile brachytherapy using either manually loaded ir-192 wire or Pulse Dose Rate after-loading was the basis for transitioning to an HDR treatment schema using Varian GammaMed. Templates with 15-18 mm spacing designed for LDR brachytherapy were found to be not ideal for HDR delivery. Spacing was initially 17 mm but was decreased sequentially to 9 mm. A new design of template was created with holes drilled every 3 mm so that inter-plane and inter-needle spacing could be generally 9 mm but increased to 12 around the urethra. Four 0.6-1.3 catheters were used. Fractionation was 4200/12 for three patients, 4500/12, 5300/17 and 3840/12 for one patient each, with fraction size close to 3 Gy, and with V125 ~ 40%, V150~20% and V200 ~5%. The final patient, whose dosimetry parameters were not ideal for HDR delivery, was the only one who was followed these parameters, was the only one who was implanted for larger volumes remains to be determined.

Conclusions: HDR penile brachytherapy is effective and can be delivered safely (as evidenced by two recent reports from Sharma et al. and Kellas-Slezczka et al.) but attention must be paid to catheter spacing, fractionation and implant homogeneity parameters.

32 MULTICENTRE CANADIAN EXPERIENCE USING INTRAOPERATIVE PROSTATE BRACHYTHERAPY FOR TREATMENT OF LOW AND INTERMEDIATE-RISK PROSTATE CANCER; AN EVALUATION OF LONG-TERM BIOCHEMICAL RELAPSE-FREE SURVIVAL OUTCOMES
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Purpose: To estimate the rate of biochemical recurrence in prostate cancer treated with intraoperatively planned, low dose rate, prostate brachytherapy using an automated delivery system (IO-LDRB).

Methods and Materials: Patients treated with IO-LDRB as a single modality treatment for low or low-tier intermediate-risk prostate cancer at three Canadian centres between December 1997 and August 2015 were pooled for analysis. Retrospective or prospective databases were maintained at each centre. For this analysis the datasets were amalgamated and analyzed using the R programming language build 3.1.3 (www.r-project.org).

Shapiro-Wilk tests of normality, descriptive statistics and Kaplan-Meier survival estimates of biochemical relapse-free survival (bRFS) were employed for analysis.

Results: 3286 patients with a median follow up of 44 months (0.0 - 212.8) and median biochemical follow up of 40.0 months were analyzed. Median age for treated patients was 65 (42-84) years. In these patients, median initial PSA was 5.6 ng/mL (0.03 - 23.8), 2390 (74%) were T1 and 862 (26%) were T2, and initial Gleason Sum was 6 in 2383 (73%) and 7 in 810 (25%). Most patients had low volume disease: median % positive biopsy tissue 5.0% (0.1-90.0), normal gland volumes: median 34.2cc (10.9 – 77.8) and few urinary symptoms: median pre-implant AUA was 5 (0 - 33), 387 (11.8%) of patients received hormones for a median of 3.0 months (0.5-32.1) prior to implant. Median seed activity was 0.437 mCi (0.10 - 0.68), D90 was 186.7 Gy (97.0 - 273.0) and V100 was 99.37% (60.52 – 100.0). In follow up, median last PSA value was 0.13 (0.0 – 901.0) and available in 3192 patients. Biochemical failure was observed in 139 patients (5.8%) and median time to failure was 44.0 months (0.0 - 218.8). Five- and 10-year predicted bRFS were 96% and 86%, respectively. Seventy-four deaths were observed from all causes and of those, no death was attributable to prostate cancer.

Conclusions: This is the largest cohort of patients treated with IO-LDRB and demonstrates it to be an effective treatment option for patients with low and low-tier intermediate-risk prostate cancer. Rates of biochemical relapse were low several years post-treatment.

33 BRACHYTHERAPY AS A SOLE TREATMENT MODALITY FOR EARLY ESOPHAGEAL CANCER (EEC)
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Purpose: EEC is a rare disease entity with only a handful of patients diagnosed every year at most large centres treating esophageal cancer. Standard treatments for EEC include endoscopic mucosal resection, surgery (S) or chemoradiation (CRT). Patients are often not candidate for S or CRT because of their comorbidities or for EMR because of extent of tumour. Brachytherapy in these instances can give high doses of RT locally to the tumour. We present our experience using Radical Brachytherapy (RBT) alone in EEC.