**Supplementary Table 1:** Dose constraints and actual cumulative doses delivered, by organ

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Dose constraints** | **Reference plan**  **(CT plan 15 mins)** | **Actual cumulative**  **dose delivered (MRgRT)** |
| CTV WB | V 100 > 95% | V 100 = 98.25% | V 100 = 97.25 ± 4.76% |
|  | V 95 > 95% | V 95 = 99.54% | V 95 = 98.71 ± 3.75% |
| CTV boost | V 100 > 95% | V 100 = 99.37% | V 100 = 94.14 ± 6.19% |
|  | V 95 > 95% | V 95 = 100% | V 95 = 97.75 ± 4.68 |
| Bowel (individual loop) | D 2 cc < 103% (56.65 Gy) | D 2 cc = 55.54 Gy | D 2 cc = 55.54 ± 2.8 Gy |
| V 45 < 195 cc | V 45 = 32.91 cc | V 45 = 27.65 ± 12 cc |
| V 15 < 120 cc | V 15 = 87.83 cc | V 15 = 65.93 ± 23.28 cc |
| Rectum | D 2 cc < 103% (56.65 Gy) | D 2 cc = 43.88 Gy | D 2 cc = 38.14 ± 5.07 Gy |
| V 55 < 15% | V 55 = 0.03% | V 55 = 0.04 ± 0.06% |
| V 45 < 30% | V 45 = 2.71% | V 45 = 0.79 ± 0.93% |

The dose constraints for the rectum and bowel were modified from the CHHiP protocol [1]

[1] Dearnaley D, Syndikus I, Mossop H, Khoo V, Birtle A, Bloomfield D, et al. Conventional versus hypofractionated high-dose intensity-modulated radiotherapy for prostate cancer: 5-year outcomes of the randomised, non-inferiority, phase 3 CHHiP trial. Lancet Oncol. 2016;17:1047-60.

**Supplementary Table 2:** Actual dose delivered for each normal structure on MR T2 during the treatments

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Organs** | **Volume (cc)** | **D 2 cc (Gy)** | **V 45 (cc)** | **V 15 (cc)** |
| Bowel | Bowel ref | 212.292 | 55.536 | 32.9 | 87.826 |
|  | Bowel first | 189.399 | 56.35 ± 1.99 | 31.49 ± 12.29 | 70.43 ± 23.78 |
|  | Bowel last | 185.597 | 55.12 ± 3.12 | 24.67 ± 11.61 | 56.18 ± 10.42 |
|  | Bowel avg | 187.250 ± 27.79 | 55.75 ± 2.64 | 28.17 ± 12.30 | 63.50 ± 19.65 |
| Rectum | Rectum ref | 61.296 | 43.882 | 1.66 | 53.715 |
|  | Rectum first | 59.643 | 37.82 ± 5.26 | 0.73 ± 0.87 | 48.39 ± 9.82 |
|  | Rectum last | 61.059 | 38.52 ± 5.22 | 0.87 ± 1.08 | 49.58 ± 10.77 |
|  | Rectum avg | 60.197 ± 11.41 | 38.14 ± 5.07 | 0.79 ± 0.93 | 48.89 ± 10.10 |

Abbreviations: avg, average; first, MR first; last, MR last; ref, reference plan

**Supplementary Table 3**: Times using on daily workflow

|  |  |
| --- | --- |
| Procedures | Average times (minutes) |
| Rectum/ Bladder survey scan | 1.16 (0.5-1.5) |
| T2 image acquisition | 2.38 (2.04-3.21) |
| Image registration | 1.46 (0.59-2.32) |
| Image review | 1.79 (0.24-4.56) |
| Plan re-optimization (ATP) | 3.79 (3.05-5.3) |
| Plan evaluation | 2.65 (0.23-7.3) |
| Beam on | 12.70 (10.0-25.0) |
| Total time on treatment couch | 54.74 (35-73) |