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Reducing uncertainties in image-guided radiotherapy of rectal cancer

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Citation

Ende, R. P. J. van den. (2020, October 22). *Reducing uncertainties in image-guided radiotherapy of rectal cancer*. Retrieved from <https://hdl.handle.net/1887/137099>

Version: Publisher's Version

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Issue date: 2020-10-22

Reducing uncertainties in image-guided radiotherapy of rectal cancer

1. CT imaging at each fraction should be the minimal standard for treatment planning in image-guided high-dose-rate endorectal brachytherapy for rectal cancer.
(this thesis, chapter 1)
2. The need for a CT scan to detect fiducial markers on MRI limits the transition to an MRI-only workflow for high-dose-rate endorectal brachytherapy.
(this thesis, chapter 2)
3. An ultra-short echo time MRI sequence enables the visualization of individual channels within the applicator and should be included in MRI-only treatment planning for high-dose-rate endorectal brachytherapy.
(this thesis, chapter 3)
4. The use of fiducial markers for setup correction in an external beam radiotherapy GTV boost setting is at this stage not justified for tumors in the lower rectum.
(this thesis, chapter 4)
5. The comparison of clinical studies on treatment toxicity and tumor response after high-dose-rate endorectal brachytherapy is hampered by non-uniform dose prescription and dose reporting methods.
Verrijssen et al. Brachytherapy Jan-Feb;18(1):71-86.e5 (2019)
6. The full potential of high-dose-rate endorectal brachytherapy is currently not utilized due to limited shielding options of current commercially available applicators.
Webster et al. Medical Physics 40, 091704 (2013)
7. The optimal irradiation technique for a GTV boost in an organ preservation setting will depend on the ability to increase complete pathological response rates with acceptable toxicity.
8. As it is questionable whether the large variation in PTV margins for a GTV boost described in literature is justified by variations in treatment accuracy, larger studies are needed to characterize GTV displacement.
9. PhD projects and non-cartesian k-space trajectories are similar in the sense that they often do not go as planned.
10. Life is better on a boat.